

III. Extent of licit trade and latest trends in trafficking in precursors

61. The present chapter provides an overview of the major trends and developments in both licit trade and trafficking in precursor chemicals, by substance group, with a view to addressing gaps and weaknesses in precursor control mechanisms. It summarizes information on seizures

and cases of diversion or attempted diversion from international trade, as well as activities associated with illicit drug manufacture. The chapter is based on information provided to the Board through various mechanisms, such as form D, the PEN Online system, PICS, Project Prism and Project Cohesion, and through national reports and other official information from Governments.

62. Information about non-scheduled chemicals not included in Table I or Table II of the 1988 Convention, including designer precursors, which are nonetheless used in illicit drug manufacture, is reported to INCB pursuant to article 12, subparagraph 12 (b), of the Convention. Governments also share such information through PICS, which has thus developed into an early warning system for precursors, although the identification of non-scheduled chemicals frequently presents forensic challenges due to the mislabelling and misdeclaration of products that are often found in clandestine laboratories or at points of entry. **INCB would like to thank all Governments for the information received and remind them that comprehensive reporting on form D of information regarding non-scheduled substances and of circumstantial information is critical to establishing and addressing new trends at an early stage and globally. INCB therefore again encourages all Governments to improve the quality and comprehensiveness of their annual form D submissions and reiterates its recommendation to make better use of PICS.**

A. Substances used in the illicit manufacture of amphetamine-type stimulants

1. Substances used in the illicit manufacture of amphetamines

(a) Ephedrine and pseudoephedrine

63. Ephedrine and pseudoephedrine are precursors used in the illicit manufacture of methamphetamine but can be substituted with P-2-P, phenylacetic acid, APAAN, APAA and a number of non-scheduled substances (see subsects. (c) and (d) below, and annex VIII). Both ephedrine and pseudoephedrine are also used for legitimate medical purposes and are therefore among the most frequently and widely traded substances included in Table I of the 1988 Convention.

Licit trade

64. Between 1 November 2019 and 1 November 2020, exporting countries sent almost 4,600 pre-export notifications through the PEN Online system for planned

shipments of ephedrine and pseudoephedrine, in bulk and in the form of pharmaceutical preparations. The notifications were for a total of more than 950 tons of pseudoephedrine and almost 80 tons of ephedrine. The shipments originated in 41 exporting countries and territories and were destined for 166 importing countries and territories. Overall, the level of trade in both ephedrine and pseudoephedrine was about 25 per cent lower than the average of the past three reporting periods.

65. Table 2 below presents the 10 largest importers of ephedrine and pseudoephedrine, ranked in terms of volume notified through the PEN Online system, in the reporting period.

Table 2. The 10 largest importers of ephedrine and pseudoephedrine, by volume, 1 November 2019–1 November 2020

Ranking	Ephedrine	Pseudoephedrine
1	Republic of Korea	United States
2	Nigeria	Switzerland
3	Indonesia	Egypt
4	Egypt	Turkey
5	Denmark	Indonesia
6	Ghana	Brazil
7	United States	Republic of Korea
8	Singapore	Japan
9	Switzerland	Canada
10	Germany	France

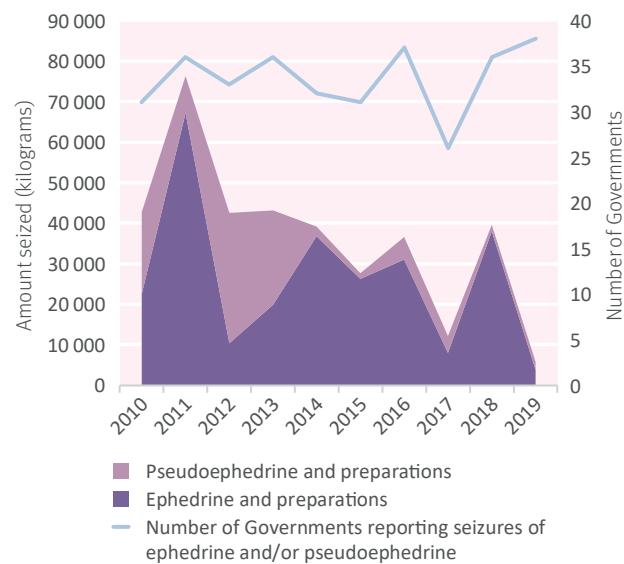
Trafficking

66. On form D for 2019, seizures totalling about 5.7 tons of ephedrine and pseudoephedrine were reported to INCB by 38 countries and territories in all regions (see figure V). That represents the lowest amount seized in several years, falling even short of the amounts seized in 2017 (12.1 tons), and also falling significantly short of explaining the amount of methamphetamine seized in those regions where ephedrines-based manufacturing methods are known to prevail.

Oceania

67. In 2019, the largest seizures of ephedrines were reported in Australia, amounting to almost 1,300 kg, of which 99 per cent was seized in a single incident, as the result of joint investigational efforts under a partnership agreement between the Australian Federal Police and the National Narcotics Control Commission of China. That seizure provides another piece of strong evidence indicating that pseudoephedrine tablets (known as “ContacNT”) have replaced ephedrine raw material as the

Figure V. Seizures of ephedrine and pseudoephedrine reported by Governments on form D, 2010–2019



main methamphetamine precursor seized in Australia and New Zealand. Yet, as in the past, no information was available on the origin of the ephedrine, i.e., whether it had been diverted from legitimate trade or illicitly manufactured, either by synthesis, from chemical pre-precursors, or by extraction from the *Ephedra* plant. Both synthesis from propiophenone or its precursors and extraction of ephedra are illicit manufacturing methods that have been encountered in China. Considering that the approaches to addressing diversion from legitimate trade will differ from the approaches needed to address the illicit manufacture of precursors and that, in the latter case, the approaches needed will further depend on whether the ephedrine was illicitly synthesized from pre-precursors or extracted from naturally grown *Ephedra* plant, the Board reminds Governments to invest in determining the nature, or origin, of seized ephedrine. INCB therefore also reiterates its recommendation to have selected samples of seized precursors forensically analysed in order to provide strategic information about their origin, as a means to subsequently address any weaknesses in control mechanisms.

68. On form D for 2019, New Zealand reported seizures of about 440 kg of ephedrine raw material, about the same amount as in 2018 (412 kg), thus indicating an end to the downward trend observed since 2016. The amount of ephedrine was seized in 45 incidents. In over 90 per cent of the cases, the origin of the substance was unknown; single incidents could be traced to China, including Hong Kong, the United Arab Emirates and the United Kingdom. Most of the seizures were made by customs authorities at points of entry, including international mail centres.

East and South-East Asia

69. The illicit manufacture of methamphetamine in East and South-East Asia continued to be predominantly ephedrines-based, but with increasing indications of the use of P-2-P-based methods, starting from non-scheduled chemicals or chemicals recently placed under international control (see subsect. 2 (d) below).

70. Nevertheless, seizures of methamphetamine precursors in East and South-East Asia continued to fall significantly short of explaining the dramatic increase in seizures and abuse of methamphetamine in that and neighbouring regions. In 2019, the total amount of ephedrines reported seized in East and South-East Asia amounted to less than 250 kg; the largest single seizure was reported by Malaysia (200 kg of pseudoephedrine, allegedly sourced in Bangladesh). Seizures of precursors of P-2-P cannot explain the methamphetamine output in that region either (see subsect. 2 (d) below).

71. After having seized almost 20 tons of ephedrine raw material, 6 tons of ephedrine preparations and more than 900 kg of pseudoephedrine in 2018, China noted a decrease in precursor seizures of almost 80 per cent in 2019, compared with 2018. Unfortunately, no further information was provided. The dismantling of an illicit ephedra processing site in China in May 2020 (see para. 91 below) is a reminder that illicit operators adapt quickly to risks and opportunities to ensure a continued supply of chemicals for illicit drug manufacture.

72. A media report in August 2020 suggested that there might be methamphetamine laboratories in Papua New Guinea and that those laboratories might be sourcing the precursors they use from cold and diet medications containing ephedrine and pseudoephedrine, while other common chemicals are easily obtainable in local stores. The Board is in the process of verifying the information.

73. The Board continues to be concerned about the scarcity of information from countries in East and South-East Asia and **encourages Governments in that region to enhance cooperation with each other and the Board with a view to curbing the illicit manufacture of methamphetamine and denying traffickers access to the required precursors, whether they are diverted from legitimate international or domestic channels, or are illicitly manufactured from non-controlled alternative precursors.**

West Asia

74. In 2019, Afghanistan and Pakistan were the only countries in West Asia that reported seizures of

ephedrines. In both countries, the amounts seized were the largest in many years. While Pakistan seized 80 kg of ephedrine, the largest amount reported since 2011, Afghanistan seized 440 kg of pseudoephedrine preparations, the largest amount reported since the reporting of seizures of pseudoephedrine started in 2016. The suspected origin of 350 kg of the seized pseudoephedrine was Pakistan; 90 kg allegedly originated in the Islamic Republic of Iran. The seizures provide further evidence of the illicit manufacture of methamphetamine in Afghanistan and of the continued use of pharmaceutical preparations, in addition to use of the *Ephedra* plant as a source for the extraction of ephedrine. Notable seizures of other chemicals, such as red phosphorous, associated with ephedrines-based methods (see para. 116 below) provide further evidence of the increasing prominence of illicitly manufactured methamphetamine in the illicit drug economy of Afghanistan.

South Asia

75. On form D for 2019, as in previous years, only India reported seizures of ephedrines, amounting to slightly more than 210 kg of ephedrine and almost 600 kg of pseudoephedrine; in all cases the substances originated in India. The majority of the destination countries were in Africa (Congo, Ethiopia, South Africa, United Republic of Tanzania, Zambia and Zimbabwe); Malaysia continued to be a destination country. The emergence of Australia as a destination country was a new and noticeable trend in 2020, with several seizures of pseudoephedrine being effected from post parcels destined for Australia from India.

76. A notable seizure that did not follow the pattern of small-scale outbound shipments was made in March 2020 and communicated through PICS. It involved the search of factory premises and a makeshift laboratory where about 480 kg of illicitly manufactured ephedrine were seized.

Africa

77. As in previous years, there was very limited information about seizures of ephedrines in Africa. On form D for 2019, only three Governments, Botswana, Ghana and Nigeria, reported seizures of ephedrine, totalling about 380 kg, of which Nigeria accounted for almost 355 kg. From other sources, INCB is aware of six seizures of ephedrine, totalling about 57 kg, in Zambia; information about the sources of the substance was not available. **The Board wishes to remind Governments of their obligation under the 1988 Convention to provide it with information on the amounts seized of substances in Table I and Table II of the Convention and, when known, their**

origin. Such information is critical for identifying emerging trends in precursor trafficking and the underlying weaknesses in control systems. That knowledge, in turn, is essential for preventing future diversions worldwide.

78. In Nigeria, to date, 17 illicit methamphetamine laboratories have been dismantled, 16 of which had used ephedrines-based methods. Of the total amount of ephedrine seized in Nigeria in 2019, two seizures, involving a total of 309 kg of ephedrine, were linked directly to an illicit methamphetamine laboratory in that country. Ephedrine smuggled out of Nigeria was most often destined for South Africa, as in the past; in 2020, an incidence of smuggling to the Democratic Republic of the Congo was also communicated.

79. In April 2019, a pharmacist was convicted in Nigeria for the diversion of 500 kg of ephedrine, of which 300 kg were recovered in the course of the investigations. The convictions were the result of several years of investigations that started with an enquiry by the Board about a shipment notified through PEN Online to a Nigerian company that was unknown to INCB. **The Board commends the authorities of Nigeria for the successful conclusion of the country's first diversion case and recommends that all Governments carefully verify the specific end uses and actual needs for ephedrines when registering new companies for both international trade and domestic distribution and use.**

North America

80. In 2019, the volume of ephedrines seized in North America reached its highest level in six years. The United States reported seizures totalling nearly 410 kg each of ephedrine and pseudoephedrine, while Canada seized 750 kg of ephedrine and some 25,000 tablets each of ephedrine and pseudoephedrine. Neither country provided any further information in that regard.

South America and Central America and the Caribbean

81. In 2019, two countries in South America, Argentina and Chile, reported seizures of ephedrine, amounting to a combined total of less than 15 kg. Of the countries in Central America and the Caribbean, Guatemala was the only one to have reported seizures of ephedrines on form D, the first such report by any country in Central America and the Caribbean in more than five years.

82. Specifically, Guatemala reported seizures of 155 kg of ephedrine preparations and 162 kg of pseudoephedrine

preparations in 2019. In addition, in connection with customs fraud investigations, in August 2020, Guatemala seized almost 80 kg of ephedrine tablets from the premises of an importing and exporting company, in packaging typically seen in South-East Asia.

Europe

83. In 2019, seizures of ephedrines in Europe, including in the form of pharmaceutical preparations, amounted to just slightly more than 250 kg. More than 60 per cent of that amount was reported by Poland, in the form of both pseudoephedrine raw material (92 kg) and pharmaceutical preparations (67 kg). Germany reported the second largest seizures of ephedrines in Europe, amounting to 23 kg of ephedrine and 10 kg of pseudoephedrine, both as raw material. That was followed by Czechia, which reported having seized 24 kg of pseudoephedrine in the form of preparations and about 6 kg as raw material.

84. The amount of the seizures provides evidence of the type of methamphetamine laboratories predominant in Europe, which continue to be small-scale, user-based laboratories that mainly use ephedrines extracted from pharmaceutical preparations. The seizures fall short, however, of explaining the increase in the illicit manufacture of methamphetamine in Europe, which is more often associated with P-2-P-based methods (see para. 116 below) and organized criminal groups.

85. In most of the seizures in Europe, the origin of the ephedrines was unknown, which was partly a result of the fact that most preparations are trafficked without the original packaging, thus making it difficult to determine their origin. In cases in which the origin was known, it was usually other European countries, including countries in South-Eastern Europe. Seizures of ephedrine in Ireland (20 kg, in 11 incidents) were made as a result of examination of postal consignments or freight at ports, airports or mail centres, suggesting that, once again, they may have been related to interregional trans-shipments aimed at disguising the origin of the substance from Asia destined for Africa and Oceania.

86. Similar to the previous year, on form D for 2019, Ukraine reported a number of small seizures of preparations containing ephedrine and pseudoephedrine. As in the past, the tablets originated in a number of countries, including Egypt, Israel and Turkey, and several countries in Europe. As noted in the Board's report on precursors for 2019, ephedrines raw material was also intercepted en route from Egypt to Ukraine via Germany; the seizures were made at mail and parcel facilities at German airports.

87. In a new development in 2019, Germany reported two cases of theft of a total of almost 540 kg of pseudoephedrine from the warehouses of a company manufacturing, trading in and shipping pseudoephedrine. Four months later, another attempted theft failed as a result of the company's increased security awareness.

(b) Norephedrine and ephedra

Licit trade

88. International trade in norephedrine, a substance that can be used in the illicit manufacture of amphetamine, remained at a low level compared with trade in other precursors of amphetamine-type stimulants. Between 1 November 2019 and 1 November 2020, 222 transactions involving norephedrine were notified through the PEN Online system: 11 exporting countries pre-notified shipments to 36 importing countries, amounting to approximately 27 tons of raw material and over 10 tons in the form of pharmaceutical preparations. Shipments amounting to 1 ton or more were pre-notified to the following importing countries, in descending order of the amounts shipped: United States, Philippines, Myanmar, Indonesia, Japan, Cambodia and Denmark. No exports of ephedra have been reported to the Board.

89. On form D for 2019, the authorities of India reported having stopped shipments of norephedrine to Somalia after the authorities there had informed them of an ongoing review of permits to import controlled substances, including precursors, into Somalia and the temporary suspension of all previously granted import permits; companies in Somalia were required to seek advice from the Ministry of Health and Human Services on a case-by-case basis.

Trafficking

90. With a few exceptions, seizures of norephedrine reported on form D have been small in recent years. However, for the last two consecutive years, the United States reported notable seizures of norpseudoephedrine (cathine), a substance controlled under the Convention on Psychotropic Substances of 1971. No seizures of ephedra have been reported on form D. However, there continued to be reports on the use of the *Ephedra* plant, the natural source of ephedrine, in the illicit manufacture of methamphetamine in Afghanistan. Seizures in Afghanistan and neighbouring countries and along trafficking routes have provided evidence of a significant increase in methamphetamine manufacture there, although the sources of the starting materials have not been unequivocally established.

91. According to an official media report, in May 2020, following several months of investigations, authorities in China raided a food processing plant in Xianyang City, Shaanxi Province, China, that was being used for the illicit processing of *Ephedra* plant to extract ephedrine. The authorities determined that the suspects had intended to process 10 tons of ephedra, with an estimated yield of 100 kg of ephedrine. The *Ephedra* plant material had allegedly been sourced in Tongliao, Inner Mongolia, China, and the ephedrine was suspected to have been smuggled to methamphetamine laboratories in the Golden Triangle. Forty-five persons were arrested, including the nine main suspects. **Governments are reminded that the use of existing industrial facilities for illicit manufacturing purposes is a recurrent modus operandi, owing to the availability of suitable infrastructure in such facilities, including for more sophisticated synthesis purposes.** In relation to the use of the *Ephedra* plant and other natural sources of ephedrine for the illicit manufacture of methamphetamine, the Board wishes to remind Governments to remain alert and to consider adopting adequate measures to reduce the risk of their use in illicit drug manufacture.

(c) P-2-P, phenylacetic acid, APAAN and APAA

92. P-2-P, phenylacetic acid, APAAN and APAA are precursors of amphetamine and methamphetamine. While P-2-P and phenylacetic acid are traded legitimately, albeit with differences in the extent of their trade, APAAN and APAA are designer precursors and trade in them is almost non-existent. Non-scheduled alternatives to P-2-P, pre-precursors and designer precursors used in the illicit manufacture of amphetamine and methamphetamine are discussed in subsection (d) below.

Licit trade

93. International trade in P-2-P continued to be limited. Between 1 November 2019 and 1 November 2020, there were 15 pre-export notifications involving P-2-P, from six exporting countries to four importing countries. As in the past few years, there were no transactions involving APAAN during the reporting period, but about 650 proposed shipments of phenylacetic acid were pre-notified through the PEN Online system, from 12 exporting countries to 47 importing countries and territories. No trade in APAA has been reported since 19 November 2019, the effective date of the scheduling of the substance in Table I of the 1988 Convention.

94. On form D for 2019, India confirmed having stopped a proposed shipment of 500 kg of P-2-P to a company in Azerbaijan. The case, which INCB noted in its report on

precursors for 2019,¹⁷ is a notable example of the successful cooperation between the competent authorities of Azerbaijan and India through the PEN Online system, and with INCB.

Trafficking

95. In 2019, the majority of the P-2-P seized continued to be seized from illicit laboratories or warehouses, indicating that it had been illicitly manufactured rather than having been diverted from a legitimate source. This applied particularly to seizures of the substance reported by the Netherlands (more than 5,700 litres), Mexico (more than 2,700 litres) and Viet Nam (1,054 litres; see para. 98 below). Regarding the largest amount of P-2-P reported seized in 2019, namely, more than 6,300 litres in Spain, as well as a seizure of 300 litres of P-2-P that allegedly originated in India, reported by Myanmar, no further circumstantial details were provided. **The Board calls on all Governments to fully investigate seizures, stopped shipments and diversion attempts involving precursors, with a view to preventing incidents in which the same or similar modi operandi are used in the future. The Board stands ready to facilitate such investigations and the exchange of shipping and other relevant documentation and information, as required.**

96. **The Board would also like to remind Governments of the importance of determining whether P-2-P has been diverted from a legitimate source and if so, what that source was, or whether the P-2-P has been illicitly manufactured from other controlled precursors or from non-scheduled pre-precursors. Distinguishing the two scenarios – diversion from legitimate sources and illicit manufacture – will enable the authorities concerned, and the Board, to devise appropriate approaches to address the underlying weaknesses.**

97. The largest seizures of **phenylacetic acid** in 2019 were reported by Mexico (more than 3.5 tons). Similar to P-2-P, seizures occurred in clandestine laboratories where the substance was used as an intermediate in the illicit synthesis of methamphetamine, via P-2-P. The most likely starting materials used in the illicit synthesis of methamphetamine in Mexico are benzyl chloride and sodium cyanide (see para. 109 below). Methylamine (see para. 128 below) is another key chemical in all P-2-P-based manufacturing methods. Mexican authorities allege that, to date, the use of precursors that are new or different to those reported on form D for 2019 and previous years has not been identified. The only other country that reported notable seizures of phenylacetic acid was Spain (1,050 kg in three instances), however, no circumstantial information was provided

98. With the exception of seizures of **APAA** in the Netherlands (totaling more than 4.3 tons), Viet Nam (350 kg) and Belgium (about 235 kg), there were no notable seizures of APAA and APAAN reported on form D for 2019. The seizure in Viet Nam was the first such seizure reported in that country, and one of the few in East and South-East Asia. In total, about 60 tons of chemicals, including more than 1,000 litres of illicitly manufactured P-2-P and related equipment were seized from a large methamphetamine laboratory. As that was one of the few reported seizures of non-scheduled or recently scheduled P-2-P pre-precursors in East and South-East Asia, **the Board commends the authorities of Viet Nam and encourages other Governments in the region to be vigilant to, and report indications of, the use of non-scheduled alternatives to P-2-P, ephedrine and pseudoephedrine as precursors in the illicit manufacture of methamphetamine in the region. The Board also encourages all Governments to share information about the sources and methods of diversion of such chemicals, preferably in real time, through PICS, or, as a minimum, in their annual submissions of form D.**

99. In 2020, through PICS, additional incidents involving P-2-P were communicated by the Netherlands (totalling more than 4,100 litres) and Mexico (totalling 420 litres). Almost all of the incidents involved illicit laboratories. Phenylacetic acid and other pre-precursors such as APAA and APAAN were sometimes seized from a single laboratory, suggesting that the seized P-2-P had been illicitly manufactured and not diverted from legitimate sources.

(d) Use of non-scheduled substances and other trends in the illicit manufacture of amphetamine and methamphetamine

Derivatives of alpha-phenylacetoacetic acid and P-2-P methyl glycidic acid

100. Following the scheduling at the international level of APAAN in 2014 and APAA in 2019, the non-scheduled precursors of P-2-P subsequently encountered in the illicit manufacture of amphetamine or methamphetamine belonged to the following chemical groups: **esters of alpha-phenylacetoacetic acid** and derivatives of **P-2-P methyl glycidic acid**. The substances in these groups are designer precursors without any known legitimate uses other than for limited research and analytical purposes. While MAPA, the methyl ester of *alpha*-phenylacetoacetic acid, was included in Table I of the 1988 Convention effective 3 November 2020, other esters of that acid and derivatives of P-2-P methyl glycidic acid have not as yet been placed under international control.

¹⁷INCB report on precursors for 2019 (E/INCB/2019/4), para. 131.

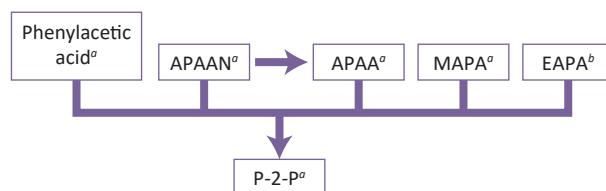
101. On form D for 2019, 9 countries reported seizures of non-scheduled designer precursors of amphetamine and methamphetamine; all of the seizures were reported by countries in Europe. The largest amounts of **MAPA** were seized in Bulgaria (8 tons) and the Netherlands (7.5 tons), followed by Belgium and Hungary (about 4 tons each), and Germany and Slovenia (about 2 tons each). Seizures were typically made in illicit laboratories or at airports or seaports. As MAPA was neither under international control nor under control in the European Union in 2019, several of the seizures were the result of cooperation between European customs authorities involving monitored deliveries.

102. Seizures of **derivatives of P-2-P methyl glycidic acid** reported on form D for 2019 were negligible, with the exception of a seizure of 890 kg reported by Belgium. The Board is also aware of the use of P-2-P methyl glycidate and MAPA in the illicit manufacture of methamphetamine in Australia in 2019. Laboratory impurity analysis also provided forensic evidence of the use of P-2-P methyl glycidate in the illicit synthesis of amphetamine for “captagon” tablets seized in Lebanon.

103. In the first 10 months of 2020, 37 incidents involving MAPA were communicated through PICS, amounting to almost 21.5 tons. All but one incident were communicated by countries in Europe. The single largest seizure of an inbound shipment of MAPA in that period was a seizure of more than 4.2 tons of the substance at Frankfurt Airport in Germany. The seizure was one of a series of seizures at that airport totalling almost 7.5 tons, in just five days in September 2020. Together with seizures at Budapest Airport in Hungary, they possibly reflect a shift in European points of entry and, given that destination countries remained largely unchanged, to more complex routing. Seizures of derivatives of P-2-P methyl glycidic acid were only communicated by the Netherlands (more than 1.1 tons).

104. As a result of the increased scrutiny of MAPA following its international scheduling in November 2020, traffickers appear to have started to show an interest in **ethyl alpha-phenylacetacetate (EAPA)**, the ethyl ester analogue of MAPA. The emergence of EAPA provides further evidence supporting the Board’s call to address groups of substances that are closely related chemically (see figure VI).¹⁸

Figure VI. Alternative chemicals used in the illicit manufacture of amphetamine or methamphetamine (scheme 1)



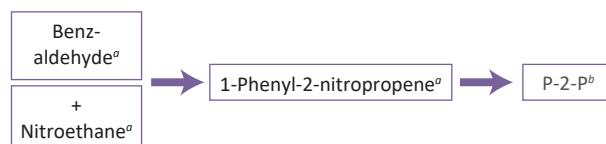
^aIncluded in Table I of the 1988 Convention; the scheduling of MAPA became effective on 3 November 2020.

^bNot under international control but included in the limited international special surveillance list.

Benzaldehyde, nitroethane and 1-phenyl-2-nitropropene

105. Benzaldehyde and nitroethane are used in the so-called nitrostyrene method to manufacture P-2-P and, subsequently, methamphetamine or amphetamine. 1-Phenyl-2-nitropropene is the chemical intermediate derived from the reaction between benzaldehyde and nitroethane and may also be encountered as a starting material in illicit laboratories (see figure VII).

Figure VII. Alternative chemicals used in the illicit manufacture of amphetamine or methamphetamine (scheme 2)



^aNot under international control but included in the limited international special surveillance list.

^bIncluded in Table I of the 1988 Convention.

106. Data reported on form D for 2019 confirm the continued decline in the importance of the nitrostyrene method, in particular in Mexico. While significant, albeit decreasing, amounts of **benzaldehyde** (more than 2,000 litres each year) were seized in the period 2015–2017, Mexico did not report any seizures of the substance in 2018 and 2019. Seizures of either of the other two chemicals indicative of the nitrostyrene method were not reported either, thus corroborating a trend of reverting back to phenylacetic acid-based manufacturing methods (see para. 97 above).¹⁹

¹⁸See the INCB report on precursors for 2018 (E/INCB/2018/4), paras. 214–230, and E/CN.7/2020/CRP.13.

¹⁹INCB report on precursors for 2019 (E/INCB/2019/4), para. 145.

107. In 2019, only Estonia continued to report notable seizures of **benzaldehyde** and **nitroethane**, amounting to 385 kg and 186 kg, respectively. The Russian Federation reported seizures of 48 kg of benzaldehyde and 23 kg of nitroethane in 2019, in connection with the illicit manufacture of amphetamine. Ukraine reported seizures of 66 kg of **1-phenyl-2-nitropropene**, including one incident at the point of entry into the country, with China as the alleged origin of the substance. In addition, Ukraine was the country most frequently associated with incidents involving 1-phenyl-2-nitropropene communicated through PICS in 2019 and 2020. Seizures of the substance in other countries suggest that the nitrostyrene method continues to be used in smaller-scale user-based laboratories.

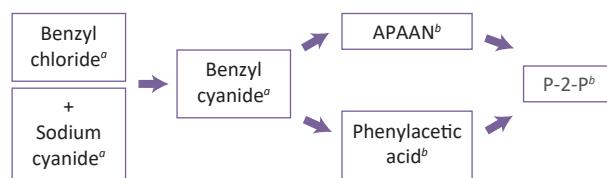
108. In 2019, Costa Rica reported the largest seizure of benzaldehyde worldwide (almost 1.5 tons) in a misdeclared shipment from Guatemala. However, the intended end purpose of the substance was unknown.

Benzyl chloride, sodium cyanide and benzyl cyanide

109. Seizures of non-scheduled chemicals that can be used in the illicit manufacture of P-2-P via APAAN or phenylacetic acid continued to be reported on form D for 2019. Specifically, significant quantities of **benzyl chloride** (more than 3,700 litres) and **sodium cyanide** (almost 1.9 tons) were seized in Mexico. Those seizures provide further evidence of the illicit synthesis in Mexico of phenylacetic acid from those chemicals, a trend that has been suggested by the results of earlier forensic profiling analyses.²⁰

110. While there have been recurrent claims by government officials in East and South-East Asia of the use of sodium cyanide in the illicit manufacture of methamphetamine in that region, only Myanmar reported seizures of the substance, amounting to about 4.6 tons, on form D for 2019, the first such reported seizures in the region since 2014, when Thailand reported a seizure of 5.5 tons at the border between Myanmar and Thailand.²¹ Myanmar allegedly also seized more than 22,000 litres of benzyl cyanide, the intermediate resulting from the reaction of benzyl chloride with sodium cyanide, and an indication of the illicit manufacture of P-2-P via APAAN or phenylacetic acid (see figure VIII). In addition, Viet Nam reported a seizure of 14 litres of benzyl cyanide on form D for 2019.

Figure VIII. Alternative chemicals used in the illicit manufacture of methamphetamine or amphetamine (scheme 3)



^aNot under international control but included in the limited international special surveillance list (with the exception of sodium cyanide).

^bIncluded in Table I of the 1988 Convention.

111. While the overall picture with regard to the nature and sources of the chemicals used in the illicit manufacture of amphetamine and methamphetamine still remains unclear, **the Board commends those Governments that have been able to build the capacity to look beyond controlled precursors and share the relevant information gathered. The Board would also like to acknowledge the support of the United Nations Office on Drugs and Crime, in particular in East and South-East Asia, in building capacity in this regard, and assisting Governments in fulfilling their obligations under the 1988 Convention, and making use of existing platforms for the sharing of information on precursor-related incidents.**

Other chemicals not under international control that were seized in relation to the clandestine manufacture of amphetamine or methamphetamine

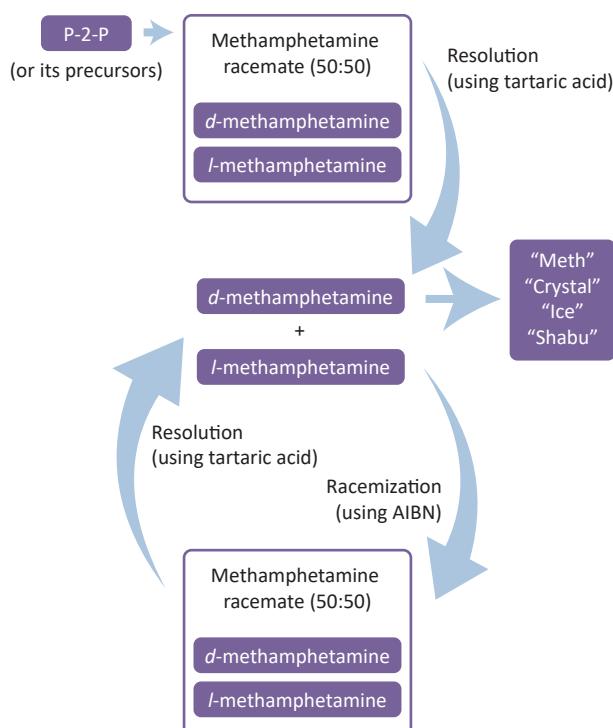
112. Since early 2020, incidents communicated through PICS have suggested the use in illicit laboratories of a modified and significantly more efficient method for manufacturing methamphetamine. Specifically, there have been a series of seizures of two chemicals known as **AIBN** (azobisisobutyronitrile) and **methyl thioglycolate**. Both chemicals are used along with other chemicals usually associated with P-2-P-based manufacturing methods and their use in such methods has the potential to produce more potent methamphetamine (see figure IX).

113. To date, the two chemicals have been encountered in illicit laboratories in the Netherlands but may also be in use elsewhere. **Therefore, the Board invites all Governments to be vigilant and communicate to it any suspicious shipments, smuggling attempts or seizures involving AIBN or methyl thioglycolate, preferably using PICS.**

²⁰Ibid.

²¹The Board is aware that Thailand seized almost 100 tons of sodium cyanide in 2019.

Figure IX. The chemistry of P-2-P-based methamphetamine manufacturing methods



114. Seizures of **tartaric acid**, the other chemical illustrated in figure IX, which is required to increase the potency of methamphetamine manufactured using P-2-P-based methods, have been reported regularly by countries in which such illicit manufacture is known to occur. On form D for 2019, Myanmar reported the largest amount of tartaric acid seized (almost 23 tons). Mexico reported seizures of about 4 tons, the lowest amount in 5 years. A total of 213 kg of the substance were seized in Viet Nam and 154 kg in the Netherlands.

115. Another innovation in illicit manufacturing methods, which was also discovered by authorities in the Netherlands, relates to a modification and simplification in the illicit manufacture of amphetamine using the so-called Leuckart method. Specifically, this involves the use of **sodium hydroxide** in the second reaction step. The corresponding incidents involving sodium hydroxide were communicated through PICS.

116. While findings relating to innovations in P-2-P-based manufacturing methods in the Netherlands provide further evidence that the illicit manufacture of methamphetamine has become established in Europe on a substantial scale, information reported on form D for 2019 suggests that ephedrines-based methods for such manufacture also continue to be widespread in that region: seven countries in Europe reported seizures of at least one of the chemicals associated with the so-called Nagai

method of illicit methamphetamine manufacture (**iodine, hydriodic acid, red phosphorous, hypophosphorous acid and phosphorous acid**). Outside Europe, seizures of such chemicals were reported by Malaysia, New Zealand, Nigeria, the Republic of Korea and the United States. The Board is also aware of two massive seizures, of red phosphorous and iodine, respectively, in Afghanistan.

117. In contrast to Europe, in East and South-East Asia, a different ephedrines-based method has long been the predominant method of illicit methamphetamine manufacture. Central to the so-called Emde method is **thionyl chloride**, a chemical that has almost exclusively been reported seized in East and South-East Asia. In 2019, Myanmar seized a record amount of 11,600 litres of thionyl chloride. The Board has repeatedly drawn attention to the significance of chemicals not under international control in the illicit manufacture of amphetamine and methamphetamine. Furthermore, the Board has noted the dynamic nature of illicit manufacture using non-scheduled chemicals, as well as the fact that in some regions there is a major discrepancy between, for example, illicit methamphetamine manufacture and reports about seizures of chemicals used in such manufacture. Bearing in mind forensic capacity and issues relating to the identification of new and unusual chemicals, **the Board encourages all Governments to make better use of its limited international special surveillance list of non-scheduled chemicals and to remain alert with regard to the use of such chemicals in the illicit manufacture of amphetamine and methamphetamine.**

2. Substances used in the illicit manufacture of MDMA and its analogues

118. With the international scheduling of 3,4-MDP-2-P methyl glycidate and 3,4-MDP-2-P methyl glycidic acid, effective 19 November 2019, the number of substances under international control that can be used in the illicit manufacture of MDMA and related substances increased to six (see annex VIII).

- (a) 3,4-MDP-2-P, 3,4-MDP-2-P methyl glycidate, 3,4-MDP-2-P methyl glycidic acid and piperonal

Licit trade

119. Among the precursors of MDMA, piperonal is the most widely traded, while trade in 3,4-MDP-2-P is very limited, and 3,4-MDP-2-P methyl glycidate and 3,4-MDP-2-P methyl glycidic acid are typical examples of designer precursors whose trade, if any, is limited to research and analytical purposes.

120. Specifically, between 1 November 2019 and 1 November 2020, 15 exporting countries and territories notified the authorities of 47 importing countries and territories of about 790 proposed exports of piperonal; both the number of exporting and importing countries in that period remained about the same as in previous years. There were no pre-export notifications for 3,4-MDP-2-P or for the two substances recently added to Table 1 of the 1988 Convention, 3,4-MDP-2-P methyl glycidate and 3,4-MDP-2-P methyl glycicid acid.

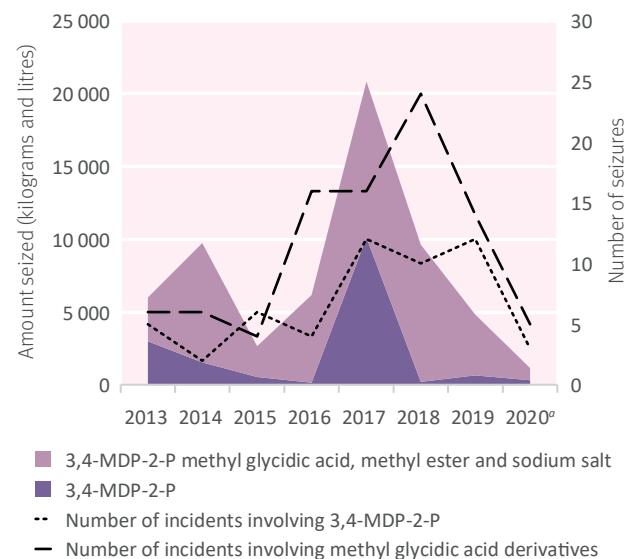
Trafficking

121. As regards the extent of the use of the various precursors of MDMA for illicit purposes, there is at present little evidence of 3,4-MDP-2-P, piperonal, safrole and isosafrole being used as starting materials in the illicit manufacture of MDMA and related substances. In cases where 3,4-MDP-2-P was seized, it had usually been illicitly manufactured. By contrast, significant seizures of 3,4-MDP-2-P methyl glycidate and 3,4-MDP-2-P methyl glycicid acid continued to be reported in 2019.

122. On form D for 2019, the only notable seizures of 3,4-MDP-2-P were reported by the Netherlands (more than 630 litres, in 12 incidents), while the recently scheduled derivatives of 3,4-MDP-2-P methyl glycicid acid accounted for the largest share of seizures of precursors of MDMA and related substances. This situation has been observed for several years, including by means of PICS (see figure X).

123. In 2019, notable seizures of precursors of MDMA and related substances continued to be made exclusively in Europe, notably in the Netherlands. Brazil reported small seizures of 3,4-MDP-2-P methyl glycidate after the substance was placed under national control in October 2019; the amount seized was suspected to have been purchased online. Small amounts were also reported for the first time by the United States. While the introduction of controls over derivatives of 3,4-MDP-2-P methyl glycicid acid will likely increase the geographic spread of seizures of MDMA precursors in the future, to date, through PICS, only nine incidents have been communicated from outside Europe, six of which involved 3,4-MDP-2-P and three of which involved derivatives of 3,4-MDP-2-P methyl glycicid acid. Two of the latter three incidents occurred in Oceania (in Australia in 2019) and one in West Asia (in Lebanon in 2017). **The Board reminds all Governments that these chemicals continue to be available through online vendors and trading platforms and encourages them to enforce any applicable regulations aimed at preventing the misuse of the Internet for the diversion of chemicals**

Figure X. Seizures of 3,4-MDP-2-P and derivatives of 3,4-MDP-2-P methyl glycicid acid communicated through the Precursors Incident Communication System, 2013–2020



^aData only cover the first 10 months of 2020.

into illicit channels or, at a minimum, to use such information to generate actionable intelligence for use in further investigations.

(b) Safrole, safrole-rich oils and isosafrole

Licit trade

124. Trade in safrole and safrole-rich oils has remained relatively stable over the years in terms of the number of exporting and importing Governments and the amounts traded. Between 1 November 2019 and 1 November 2020, six exporting countries sent 25 pre-export notifications regarding safrole and safrole-rich oils to the authorities of 15 importing countries and territories through the PEN Online system. Those notifications concerned a total volume of about 1,400 litres, the majority of which was exported in the form of safrole-rich oils. There were no pre-export notifications for isosafrole.

Trafficking

125. Very few Governments have reported seizures of safrole and safrole-rich oils on form D in recent years. In 2019, the Philippines reported the largest seizures, amounting to almost 440 litres, followed by the United States, which accounted for slightly more than 250 litres. Small amounts were also seized in the Netherlands and Spain. No seizures of isosafrole have been reported for several years.

(c) Use of non-scheduled substances and other trends in the illicit manufacture of MDMA and its analogues

126. Possibly as a result of the international scheduling of 3,4-MDP-2-P methyl glycidate and 3,4-MDP-2-P methyl glycidic acid, the year 2019 saw an increase in reports and the geographical spread of the use of **helional** in the illicit manufacture of MDA and MDMA. Brazil reported the domestic diversion of almost 220 kg of helional and its subsequent seizure from two illicit laboratories involved in the synthesis of MDA, representing the first notable report of the use of helional in South America.

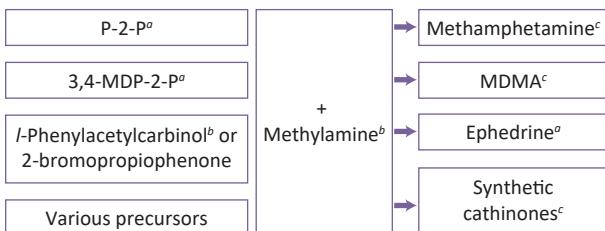
127. The use of helional in the illicit manufacture of MDA has been encountered since 2011, in Australia and the United States. In a survey conducted by the Board in 2014, Australia, Canada, the Netherlands and the United States mentioned incidents that had involved helional as a starting material in illicit laboratories or its smuggling and illicit importation. Notable seizures of helional were reported by Canada in the period 2014–2016 and by the Netherlands in 2014, although subsequent seizures of the substance in that country were small. The Board is also aware of the dismantling in 2019 of a small, user-based laboratory in Germany in which MDA had been synthesized from helional.

3. Other trends in the illicit manufacture of amphetamine-type stimulants

Methylamine

128. Methylamine is a versatile chemical that is required in the illicit manufacture of a number of amphetamine-type stimulants (e.g., methamphetamine and MDMA) and new psychoactive substances, namely, synthetic cathinones, as well as ephedrine (figure XI).

Figure XI. Use of methylamine in illicit drug manufacture



^aIncluded in Table I of the 1988 Convention.

^bNot under international control but included in the limited international special surveillance list.

^cMethamphetamine, MDMA and some synthetic cathinones are controlled under the Convention on Psychotropic Substances of 1971.

129. On form D for 2019, seizures of methylamine continued to be reported by the Netherlands (more than 4.3 tons) and Mexico (more than 2,600 litres). Viet Nam reported seizures of 70 litres of the substance in connection with a large-scale methamphetamine manufacturing laboratory in Kon Tum Province in its central highlands region, bordering the Lao People's Democratic Republic and Cambodia.

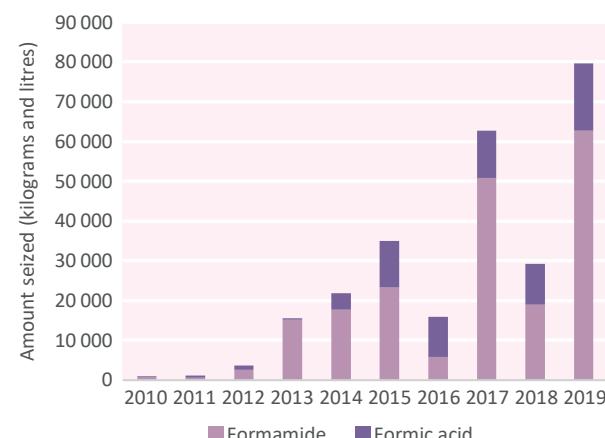
Hydrogen gas

130. Thefts and seizures of hydrogen gas, which can be used as a reducing agent in the illicit manufacture of a number of synthetic drugs, continued to be reported on form D for 2019. Specifically, the Netherlands reported seizures totalling 2.4 tons of hydrogen gas, a slight increase from 2 tons in 2018 but significantly lower than the amounts reported annually between 2014 and 2017. In addition, Germany noted that thefts of the hydrogen gas had decreased in 2018, after peaking between 2015 and 2017. However, in 2019, the number of thefts of the gas significantly increased again, involving a total of more than 9.5 tons, an amount which authorities in Germany estimated could potentially have been used in the illicit manufacture of more than 14 tons of MDMA. In 2019, for the first time, Germany encountered a theft of laboratory equipment for use in the illicit manufacture of drugs.

Formamide and formic acid

131. Formamide and formic acid are versatile solvents and synthetic reagents that are required in the illicit manufacture of amphetamine from P-2-P using the so-called Leuckart method. They can also be used to manufacture other amphetamine-type stimulants. Owing to the history of illicit amphetamine manufacture in Europe (as opposed to illicit methamphetamine manufacture in many other regions of the world), seizures of formamide and formic acid have typically been made in Europe, with an increasing trend over the years (see figure XII).

Figure XII. Seizures of formamide and formic acid, as reported by Governments in Europe on form D, 2010–2019



132. Incidents involving formamide and formic acid also continued to be communicated through PICS in 2020. An investigation into one such incident in Germany that began with the backtracking of dumped chemicals led to a company that was known by the authorities as a reliable industry partner. Yet, chemicals, including formamide and formic acid, and other non-scheduled chemicals, as well as some acids and solvents included in Table II of the 1988 Convention, were ordered in bulk and then refilled into smaller jerry cans on the company's premises with a view to supplying clandestine laboratories in the Netherlands. The case is a reminder of the importance of the know-your-customer principle and of the need to scrutinize individual transactions and carefully review orders and circumstances on a case-by-case basis.

B. Substances used in the illicit manufacture of cocaine

1. Potassium permanganate

Licit trade

133. Trade in potassium permanganate remained relatively stable during the reporting period, involving a similar number of importing and exporting countries and similar amounts. Specifically, the authorities of 33 exporting countries and territories sent more than 1,500 pre-export notifications to 115 importing countries and territories relating to a total of more than 32,500 tons of potassium permanganate. The main exporter was China, accounting for approximately 25,000 tons, followed by India and the United States, accounting for more than 3,800 tons and 2,700 tons, respectively. As in the previous reporting period, the main importers were countries in East and South-East Asia. Imports of the substance by the three coca-producing countries in South America – Bolivia (Plurinational State of), Colombia and Peru – continued to account for a very limited proportion of the total global amount imported (less than 1 per cent). Imports of the substance by other countries in South America amounted to 4 per cent (1,300 tons), a slight increase over last year. None of those countries exported or re-exported potassium permanganate in any significant amounts.

134. On form D for 2019, the Lao People's Democratic Republic reported having stopped incoming shipments involving more than 2,000 tons of potassium permanganate. Jordan stopped imports of about 23 tons, while Spain stopped exports of almost 36 tons destined for nine countries and India stopped 5 tons destined for Yemen. Although the majority of those shipments were stopped for administrative reasons, INCB would like to remind

Governments that comprehensive and timely information on shipments of substances that have been stopped on the basis of sufficient evidence that the substances may have been diverted into illicit channels is essential to addressing emerging trafficking trends at an early stage and globally. INCB also wishes to remind Governments that thwarted attempts to divert a given substance should receive the same investigative attention that would be afforded to a seizure of the same substance, since such cases provide valuable intelligence that, if shared internationally, could prevent attempts to divert the substances from other sources.

Trafficking

135. Potassium permanganate is the principal oxidizing agent used in the illicit manufacture of cocaine, and most of the cocaine that is seized continues to be highly oxidized.²²

136. On form D for 2019, 20 countries and territories reported seizures of potassium permanganate. The largest seizures were reported by Colombia (a total of almost 47 tons, in 344 incidents), Chile (7.7 tons, in 1 incident, en route to the Plurinational State of Bolivia), Pakistan (more than 4.8 tons), Germany (3 tons, in 1 incident) and Venezuela (Bolivarian Republic of) (almost 2.8 tons, in 3 incidents). As in the past, very little circumstantial information was provided in relation to those seizures, yet the substance typically originated from within the country in which the seizure was made. INCB therefore wishes once again to reiterate its call to all Governments, especially those of countries in South America, to review their domestic control mechanisms for potassium permanganate and to devise strategies to address the situation in that regard.

2. Use of non-scheduled substances and other trends in the illicit manufacture of cocaine

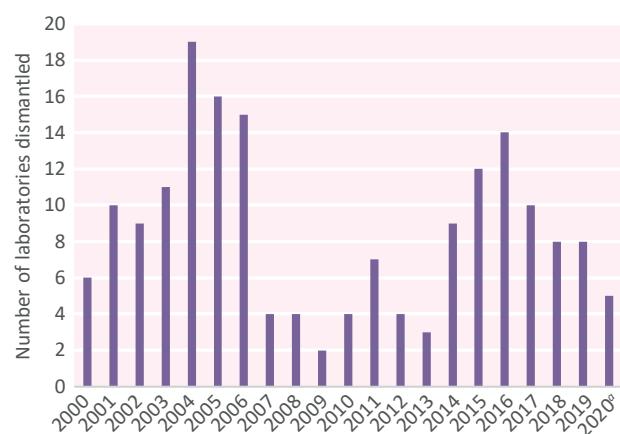
137. Several countries in South America have placed various other chemicals that can be used in the illicit manufacture of cocaine under national control. In 2019, as in previous years, the majority of those chemicals were reported to have been diverted from domestic distribution channels. Illicit manufacture also remains a source of those chemicals for illicit purposes.

²² According to results from the Cocaine Signature Program of the United States Drug Enforcement Administration Special Testing and Research Laboratory, only about 1 per cent of the cocaine samples examined, from seizures in 2019 in the United States, were moderately or not oxidized.

Precursors of and substitutes for potassium permanganate

138. On form D for 2019, the largest seizures of **potassium manganate**, an immediate precursor of potassium permanganate, were reported by Colombia (1.4 tons, in four incidents), as in the past. In the first 10 months of 2020, five potassium permanganate laboratories were destroyed (see figure XIII).

Figure XIII. Potassium permanganate laboratories dismantled in Colombia, 2000–2020



Source: Colombian Drug Observatory.

^aData only cover the first 10 months of 2020.

139. A seizure of 48 kg of potassium manganate was also reported by the Netherlands, reflecting the increase in cocaine-related incidents in that country. The Netherlands also reported a seizure of 80 kg of **sodium permanganate**, a direct substitute for potassium permanganate, following a seizure of 15 kg of the substance in 2018. The only other seizures of the substance ever reported to INCB were made in the Plurinational State of Bolivia in 2016, amounting to 260 kg.

140. No seizures of **manganese dioxide** (pyrolusite), a precursor of potassium manganate, and no seizures of **sodium hypochlorite**, a possible substitute for and complement to potassium permanganate, were reported by any country in 2019.

Other substances not under international control, and trends in the illicit manufacture of cocaine

141. In addition to requiring an oxidizing agent such as potassium permanganate or any of its substitutes, the processing of cocaine requires a variety of other chemicals, including common acids, bases and solvents used in the extraction of cocaine base from coca leaves and for the

conversion of cocaine base into hydrochloride. In addition, over the years, a number of other chemicals have also been encountered in clandestine cocaine laboratories, including chemicals that help to improve the efficiency of the manufacturing process, such as sodium metabisulfite and calcium chloride, as well as chemicals used to illicitly manufacture controlled precursors. The majority of those chemicals continued to be sourced domestically.

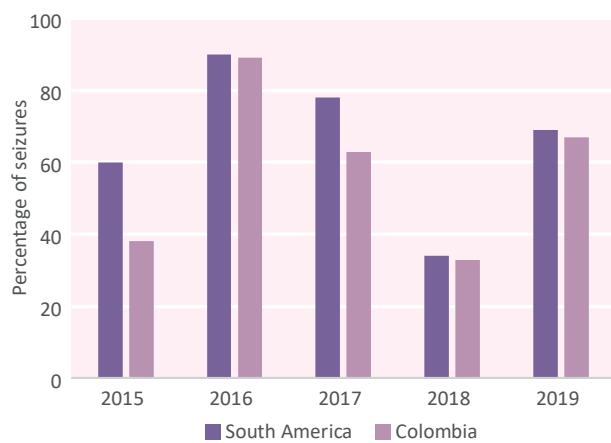
142. Overall, on form D for 2019, those chemicals were reported seized in comparable amounts by the same countries, notably countries in South America, countries situated along cocaine trafficking routes and countries representing destination markets where cocaine was being recovered from the materials into which it was incorporated for the purpose of smuggling. For example, seizures of **sodium metabisulfite**, a reducing agent used to standardize the oxidation level of cocaine base sourced from multiple extraction laboratories prior to further processing, outside South America have only been reported in Europe. In 2019, for the fourth consecutive year, seizures were reported by the Netherlands; the only other European country that had previously reported seizures of sodium metabisulfite was Spain. Unlike the trend of previous years, the amount of **calcium chloride** seized in Ecuador decreased to about 63 per cent of the amount seized in 2018 (about 90 tons) and was only second to the amount seized in Colombia (125 tons). The amount seized in Peru decreased as well, from more than 14 tons in 2018 to just below 6 tons in 2019. On 1 January 2020, calcium chloride was placed under control in Peru (see para. 15).

143. With regard to seizures of **acetate solvents** (methyl, ethyl, butyl and propyl acetate and recycled mixtures of them) used in the final crystallization step of cocaine manufacture, in which cocaine base is converted into cocaine hydrochloride, the overall situation in 2019 was similar to previous years in that the majority of the seizures were made in Colombia, where all such substances are under national control.

144. While forensic profiling results in late 2018 had suggested a shift away from ethyl acetate towards other acetate solvents,²³ seizure data for 2019 again showed an increase in the use of ethyl acetate, compared with 2018 (figure XIV). In addition, more recent forensic profiling results indicate that ethyl acetate is the predominant solvent in cocaine samples seized in Europe, a profile rarely seen in cocaine seized in the United States.

²³United States Drug Enforcement Administration Special Testing and Research Laboratory, Cocaine Signature Program; based on cocaine samples seized in the United States.

Figure XIV. Percentage of seizures of ethyl acetate among seizures of all acetate solvents reported on form D in South America and Colombia, 2015–2019



145. Authorities in Colombia have estimated that 90 per cent of the solid substances needed for the production of cocaine paste and base is **cement**, while 99 per cent of liquid substances needed is **gasoline or other types of**

hydrocarbons. Gasoline was also the chemical most affected by the COVID-19-related supply chain disruptions in early 2020, which had some, albeit short-term, impact on the illicit production of cocaine.

146. Chemicals needed in cocaine processing that were reported to have been illicitly manufactured in 2019 or of which there were indications of such manufacture included ammonia, hydrochloric acid, sodium carbonate and sulphuric acid. Chile, Colombia and Peru each reported one or more incidents involving such manufacture.

147. As with other drugs, seizures of **cutting agents** (adulterants and diluents) continued to be reported, including in connection with the illicit processing of cocaine. Cutting is performed at the stage of initial crystallization of cocaine hydrochloride, at points along the trafficking route, or in destination countries before retail-level distribution. Analysis of cutting agents can provide valuable clues for efforts to counter trafficking. **INCB reminds Governments of the investigative value of monitoring adulterants and cutting agents and encourages them to consider taking action against cutting agents, in accordance with article 13 of the 1988 Convention.**

Box 1. Estimated requirements for chemicals for the manufacture of cocaine hydrochloride in Colombia, 2019

On the basis of the potential illicit manufacture of 1,137 metric tons of cocaine hydrochloride in 2019 (an increase of 1.5 per cent from 2018),^a authorities in Colombia estimated the demands for chemicals essential for the conversion of coca paste into coca base and subsequently into that amount of cocaine hydrochloride as follows:

<i>Chemical</i>	<i>Amount</i>	<i>Unit of measurement</i>
Organic solvents		Thousands of litres
Ethyl acetate	17 700	
Butyl acetate		
n-Propyl acetate		
Recycled mixture of the above solvents		
Calcium chloride	1 398	Metric tons
Hydrochloride acid	284	Thousands of litres
Sulphuric acid	2 600	Thousands of litres
Potassium permanganate	361	Metric tons

^aUNODC and Colombia, *Monitoreo de Territorios afectados por Cultivos Ilícitos 2019* (Bogotá, Sistema Integrado de Monitoreo de Cultivos Ilícitos, 2020).

C. Substances used in the illicit manufacture of heroin

1. Acetic anhydride

148. Acetic anhydride, which is a key precursor in the illicit manufacture of heroin and is also used in the illicit manufacture of P-2-P and, subsequently, amphetamine and methamphetamine, is one of the most frequently and widely traded chemicals included in Table I of the 1988 Convention.

Licit trade

149. From 1 November 2019 to 1 November 2020, the authorities of 26 exporting countries and territories used the PEN Online system to submit more than 1,700 pre-export notifications regarding shipments of acetic anhydride. The shipments were destined for 91 importing countries and territories and involved a total of about 565 million litres of acetic anhydride. About 46 per cent of that amount was destined for European Union member States, and 20 per cent for the United States.

150. The rate of objections to pre-export notifications related to proposed exports of acetic anhydride remained stable, at just over 7 per cent, similar to 2019, yet lower than the 10.5 per cent noted in the period 2016–2018. Most objections were made for administrative reasons, and about half of the objected shipments involved imports into the United States, from Mexico.

151. The low number of diversions from international trade confirms the preventive role that the PEN Online system has played over the years; it also substantiates the Board's concern that diversion from domestic distribution channels remains the prevailing source of acetic anhydride for illicit purposes.

Trafficking

152. In 2019, global seizures of acetic anhydride totalled 60,049 litres and were thus significantly – by about 69 per cent – lower than in 2018, when global seizures of the substance amounted to a total of 194,281 litres (about 67,000 litres more than in 2017). Preliminary data suggest that this downward trend might have continued in 2020.

153. Reasons for the significant decrease in the amounts of acetic anhydride seized in 2019 and 2020 might include the following: (a) a decline in the number of diversion attempts and actual diversions, and in the subsequent trafficking of the substance, compared with the peak period of 2016–2018; (b) the emergence of trafficking in acetyl chloride; and (c) the shift to alternative trafficking routes.

154. Compared with 2018, when six countries – China, Georgia, Iran (Islamic Republic of), the Netherlands, Pakistan and Turkey – each reported seizures of more than 10,000 litres of acetic anhydride, in 2019, the Islamic Republic of Iran and Pakistan, with seizures totalling 15,000 litres and 19,060 litres, respectively, were the only two countries that reported seizures exceeding that amount. Another five countries seized 3,000 or more litres of acetic anhydride, including Belgium (3,000 litres), Bulgaria (8,000 litres), Myanmar (4,140 litres), the Netherlands (4,063 litres) and Romania (4,975 litres).

155. In Afghanistan, the amount of acetic anhydride seized in 2019 (786 litres) was 10 times lower than the amount seized in 2018 (7,364 litres), and was the lowest since at least 2008, when Afghanistan started reporting seizures of the substance on form D. In the first ten months of 2020, Afghanistan reported nine seizures of small amounts of acetic anhydride, amounting to over 600 litres.

156. However, the small amount of acetic anhydride seized within Afghanistan in 2019 and 2020 does not necessarily suggest that trafficking of the substance into the country, or the countries that share borders with Afghanistan, has completely halted. For example, in April 2020, authorities in the Islamic Republic of Iran seized a consignment of 15 tons of acetic anhydride destined for Afghanistan. The seized consignment, misdeclared as paint, was transported from or through the port of Jebel Ali in the United Arab Emirates. In addition, Pakistan, which for a number of years has been a transit country for chemicals smuggled into Afghanistan, communicated in November 2019 a seizure of a consignment of 19,060 litres of acetic anhydride in Karachi, Pakistan. The seized substance was allegedly misdeclared as acetic acid. A further seizure of 3,210 kg of acetic anhydride, suspected of having originated in China, was made in Karachi in June 2020.

157. The Board has noted that some trafficking routes that had emerged and had been exploited by traffickers between 2016 and 2018 may already have lost, in part, their significance with regard to acetic anhydride trafficking. For example, in Georgia, a country on the so-called Southern Caucasus route, seizures of acetic anhydride dropped from 13,733 litres in 2018 to only 1 litre in 2019.

158. In Turkey, which lies on the Balkan route, seizures of acetic anhydride also significantly decreased, from 38,569 litres in 2018 to 803 litres in 2019, the lowest amount of the substance seized in the country since 2013. According to authorities in Turkey, this drop in seizures could in part be attributed to strengthened control measures and law enforcement activities that might have had a deterrent effect on the trafficking of acetic anhydride through Turkey.

159. For a number of years, there have been few seizures of acetic anhydride in Central Asia. Kazakhstan and Turkmenistan have not reported from D any seizures of acetic anhydride since 2010 and 2000, respectively. In 2019, authorities in Tajikistan seized 49 litres of the substance. The alleged destination of the substance was Afghanistan. The authorities in Kyrgyzstan also reported seizures of smaller amounts of acetic anhydride (95 litres) in 2019, the first such seizures reported in that country since 2012, when almost 800 litres were seized.

160. In Europe, the largest number of seizures (seven) of acetic anhydride between 2019 and 2020 was communicated by the Netherlands. Most of the incidents occurred in warehouses or in connection with the dismantling of clandestine drug laboratories, in which the substance was seized along with other internationally controlled, as well as non-scheduled, chemicals. In December 2019, authorities in the Netherlands seized 950 litres of acetic anhydride from an illicit laboratory. The seized substance was mislabelled and believed to be destined for the Islamic Republic of Iran. The seizure appeared to be linked with another

seizure of 8,000 litres of acetic anhydride a few days later in Bulgaria. In both cases, investigations have been initiated in the countries concerned.

161. In Germany, the high number of diversion attempts involving acetic anhydride in the period 2016–2017 started to decrease during 2018. Owing to action taken by authorities in Germany, most of the identified diversion attempts were prevented and, as a result, the total amount of the substance seized in Germany has remained low in the past three years. In 2019, only one diversion attempt was identified and investigated, in cooperation with other European countries.

162. Despite the demand for significant amounts of acetic anhydride for the illicit manufacture of heroin in Colombia, Mexico and Myanmar, the number of seizures of the substance in those countries continued to be low. Since 2008, seizures of acetic anhydride in Colombia have not exceeded 100 litres per year, except for 2010, when 1,006 litres of the substance were seized. In 2019, Colombia did not report any seizures of acetic anhydride.

Box 2. Progress towards addressing Internet-facilitated trade in precursors

In its two previous reports on precursors, the Board reported on a seizure of almost 10 tons of acetic anhydride in India in 2018, the largest amount of the substance seized in the country since 2000.^{a,b} The seizure was a result of investigations, in cooperation with the private sector, into a number of suspicious requests for supplies of acetic anhydride that had been posted by suspected criminals on several online trading platforms in India.

Those investigations also revealed that the online trading companies that had allowed on their platforms the posting of suspicious requests for supplies of acetic anhydride were, according to the national information technology law of India, intermediaries and thus enjoyed exemption from any liability for facilitating suspicious trade in precursors, unless knowledge of the offence or contravention could be attributed to them.

As that was not the case, and as there was no legal instrument available to secure such information, the details of the suspicious requests for supplies and the companies involved were shared with the competent national authorities by the online companies involved on a voluntary basis.

Apart from voluntary cooperation between the Government and the private sector, and perhaps on the basis of its previous practical experience, the Government of India decided to amend its respective legislation on precursors to also include on the list of regulated activities involving precursors activities involving the offering for sale or distribution, or mediating in the sale or purchase through a website, social media or in any other manner, of precursors. In accordance with the amended legislation, such activities would require prior authorization (registration) of the company involved by the competent national authorities of India. In addition, online trading platforms that facilitated trade in precursor chemicals were also required to provide the details of transactions involving selected precursors.

^a INCB report on precursors for 2019 (E/INCB/2019/4), box 3.

^b INCB report on precursors for 2018 (E/INCB/2018/4), para. 186.

163. In Mexico, where past seizures of acetic anhydride were more likely to have been linked with the manufacture of methamphetamine (via phenylacetic acid and P-2-P) rather than of heroin, only 133 litres of the substance were reported seized in 2018 and only 15 litres in 2019. That was considerably less than the average amount of acetic anhydride seized annually in the country from 2015 to 2017 (5,000 litres) and from 2010 to 2014 (27,500 litres).

164. On form D for 2019, Myanmar reported seizures of more than 4,000 litres of acetic anhydride, the largest amount reported seized by the country since 2001. The Board is also aware of a seizure of almost 10,300 litres of acetic anhydride from a truck in Myanmar in August 2020. In the same incident, about 1,300 litres of hydrochloric acid and 200 kg of caffeine were also seized. Authorities in Myanmar noted that, during 2020, most of the precursors smuggled into the country had been smuggled across the border between China and Myanmar, at Muse Township, Myanmar, and subsequently transported to illicit manufacturing sites in the border area, where governance was limited owing to armed conflicts there.

2. Use of non-scheduled substances and other trends in the illicit manufacture of heroin

165. The illicit manufacture of heroin requires, in addition to acetic anhydride, a variety of other common chemicals not under international control. In addition, some chemicals have been known to be used as cover load or to otherwise conceal acetic anhydride contraband. One such chemical is **glacial acetic acid**, which has also been suspected of being used in the acetylation of morphine to yield heroin, probably mixed with acetic anhydride.²⁴

166. Since 2016, the intended and actual use of glacial acetic acid as a cover load for acetic anhydride contraband has been reported by several countries in Africa, Europe and West Asia. The actual use of acetic acid in heroin laboratories in Afghanistan, where the substance was mixed in various ratios with acetic anhydride, was earlier confirmed by authorities in Afghanistan in the framework of the INCB Operation Eagle Eye in 2013.

167. In Afghanistan, seizures of significant amounts of glacial acetic acid have been encountered since at least 2011. The largest seizure of glacial acetic acid in Afghanistan involved a shipment of 20,271 litres of the substance seized in April 2016. In March 2019, authorities in Afghanistan communicated through PICS another large seizure of glacial acetic acid (9,780 litres). In recent years,

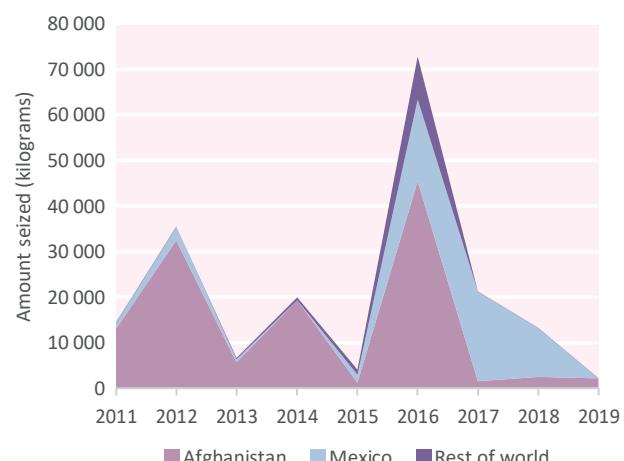
both Afghanistan and the Islamic Republic of Iran have also reported small seizures involving both glacial acetic acid and acetic anhydride. The last such seizure, conducted in Afghanistan in March 2020, involved about 80 litres of glacial acetic acid and 120 litres of acetic anhydride.

168. **Acetyl chloride** is another chemical substance included in the INCB limited international special surveillance list because of its potential use as an acetylating agent in the illicit manufacture of heroin. The first known seizure of acetyl chloride in Afghanistan, involving 90 litres, was reported in October 2017, and the second in June 2019 (300 litres).

169. Within West Asia, significant amounts of acetyl chloride were seized in the Islamic Republic of Iran in May 2018 (19,950 litres) and August 2019 (16,840 litres), as well as in the United Arab Emirates in May 2018 (2,777 litres). The alleged country of origin of the seized acetyl chloride in all three cases was China. **The Board wishes to reiterate its earlier call to all countries, in particular those in West Asia, to remain vigilant with respect to attempts to traffic acetyl chloride through the region, and to communicate any seizures of the substance through PICS and report them on form D, with a view to identifying any new trends and devising suitable countermeasures.**

170. Another chemical not under international control but included in the Board's limited international special surveillance list and frequently encountered in connection with the illicit manufacture of heroin (and methamphetamine) is **ammonium chloride**. According to information available to INCB, ammonium chloride is under national control in at least 11 countries, however, only Afghanistan and Mexico have regularly reported seizures of the substance (see figure XV). Information on the origin of the substance was usually not available.

Figure XV. Seizures of ammonium chloride reported on form D, 2011–2019



²⁴INCB report on precursors for 2015 (E/INCB/2015/4), para. 152.

D. Substances used in the illicit manufacture of other narcotic drugs and psychotropic substances

1. Ergot alkaloids and lysergic acid

171. On form D for 2019, record seizures of precursors of lysergic acid diethylamide were reported. The United States seized almost 20 kg of lysergic acid, while Brazil reported seizures of nearly 3 kg of ergotamine that had allegedly originated in Paraguay. The amounts of both substances were the largest seized in the last 10 years worldwide. Unfortunately, no additional information was provided. No seizures of ergometrine were reported.

2. N-Acylanthranilic acid, anthranilic acid and alternative chemicals

172. On form D for 2019, small seizures of methaqualone precursors, totalling less than 5 kg, were reported by Argentina, Spain and Canada (in descending order of amounts seized).

173. However, as with other drugs, it appears that the illicit manufacture of methaqualone has increasingly relied on the use of non-scheduled alternative chemicals. On form D for 2019, South Africa reported two seizures totalling more than 2.8 tons of what had appeared to be **isatoic anhydride**, while in 2018, it had stopped three incoming shipments of **acetanthranil**, totalling more than 64 tons. Acetanthranil is a stable intermediate and immediate precursor of methaqualone, that is converted through a single-step synthetic process. It has no known legitimate uses other than in the manufacture of substances related to methaqualone but is nevertheless available from a number of online suppliers.

174. Evidence of trafficking in acetanthranil and its use in illicit manufacture has been reported by South Africa since 2015. While reports of the smuggling of the substance have so far been limited to South Africa, it cannot be excluded that similar attempts are being made elsewhere. **The Board therefore encourages Governments to be vigilant and communicate to it any suspicious shipments, smuggling attempts or seizures involving isatoic anhydride or acetanthranil, preferably using PICS.**

3. Precursors of fentanyl, fentanyl analogues and other synthetic opioids, and alternative chemicals

Licit trade

175. Between 1 November 2019 and 1 November 2020, 20 proposed shipments of ANPP were pre-notified by the authorities of 4 exporting countries to 11 importing countries and territories. The majority of the shipments involved very small amounts, indicating that they were intended for limited research and analytical purposes.

176. With regard to NPP, authorities of three exporting countries sent 20 pre-export notifications to seven importing countries, involving a total of about 3.2 tons of the substance. The Board verified the end use in a number of cases. Similar to the previous year, amounts larger than those required for limited research and analytical purposes were proposed for import into countries known to manufacture fentanyl legitimately, including Brazil, Germany, the Russian Federation, Slovakia, South Africa and the United States. The largest exporter of NPP was India.

177. In its report on precursors for 2019, the Board noted significant exports of NPP that had been under investigation in India because they were effected without the knowledge of the competent national authorities, even though NPP and ANPP had been under national control in India since February 2018.²⁵ Although the investigations in India have been concluded, the Board regrets that it has so far been unable to confirm the legitimacy of the end use of the NPP by the alleged consignee, a company in Italy. **The Board reminds Governments to adequately monitor the manufacture and distribution of NPP and ANPP, and to fully investigate all diversions and attempted diversions, with a view to gathering relevant intelligence and preventing future diversions using the same modus operandi.**

Trafficking

178. On form D for 2019, the United States reported seizures of nearly 480 kg of NPP and almost 200 kg of ANPP. The only other reported seizures of fentanyl precursors were made in Estonia, amounting to slightly less than

²⁵INCB report on precursors for 2019 (E/INCB/2019/4), para. 218.

34 kg of NPP, and in Mexico (3.8 kg of ANPP). Through other sources, INCB is aware of a seizure of a misdeclared shipment of 50 kg of ANPP in Canada. In May 2020, Mexico seized 100 kg of ANPP from sea cargo originating in China. The consignment also included nearly 70 kg of 4-AP, a non-scheduled precursor of ANPP, misdeclared as washing powder. A seizure of 100 grams of 4-AP was also reported by Germany on form D for 2019, however, no contextual information was provided. Belgium reported on form D having seized an air shipment of about 1 kg of 4-piperidone monohydrate hydrochloride, another alternative precursor of fentanyl. The shipment was misdeclared and allegedly originated in China, with the Netherlands as the destination.

179. Through other sources, the Board also became aware of an attempt to manufacture fentanyl in Australia in 2019. It was reported that the laboratory involved operated in a residential area, however, details about the specific chemicals and manufacturing method intended to be applied were not available.

180. In 2020, INCB was made aware of a consignment of 72 tons of propionyl chloride, a chemical not under international control but included in the limited international special surveillance list that can be used in the illicit manufacture of fentanyl. The shipment was stopped by the customs authorities of the Lao People's Democratic Republic en route to a consignee in Myanmar, purportedly located in a special administrative region in the eastern part of the country. The investigations by the Lao authorities did not provide sufficient evidence to substantiate the legitimate use of the substance, and the supporting documents were not issued by a recognized government authority. **INCB commends the authorities concerned for their vigilance and reminds Governments of the importance of verifying the legitimacy of shipments, including, to the extent possible, of chemicals included in the limited international special surveillance list, and in particular when they are intended for consignees in areas outside of government control.**

181. The introduction of controls on the group of fentanyl-related substances in China on 1 May 2019 appears to have resulted in an increase in attempts by traffickers to smuggle precursors, in particular non-scheduled alternative precursors, intended for the manufacture of fentanyl in destination countries. Yet, there continue to be intelligence gaps related to various aspects of this development, including trafficking routes, modi operandi and the nature of the alternative chemicals, as well as the location of fentanyl synthesis laboratories (as opposed to those

laboratories in which fentanyl in powder form is compressed into tablets).

182. Adaptation of the illicit market to the tightening of controls over the two primary fentanyl precursors, NPP and ANPP, in a number of countries is also evident from the results of forensic impurity profiling of samples of fentanyl seized in the United States. Profiling results for 2019 suggested a further decline in the use of the Siegfried method of illicit fentanyl manufacture, which involves the use of NPP or ANPP, and an accompanying increase in the Janssen method, which does not rely on the two chemicals. In 2019, the proportion of fentanyl samples analysed that had been manufactured using the Janssen method increased; for samples of fentanyl powder, to 76 per cent, from 70 per cent in 2018, and for fentanyl tablets, to 63 per cent, from 52 per cent in 2018.

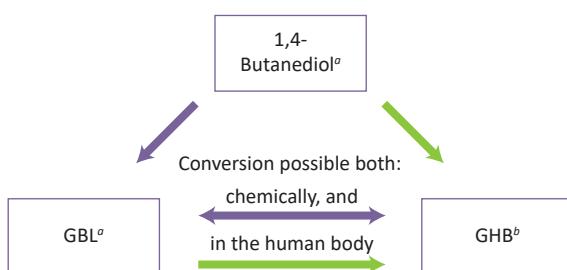
183. In line with these developments, the United States placed 4-AP and two chemicals associated with the Janssen method under control in order to prevent their use in the illicit manufacture of fentanyl (see para. 18). Given that several of the alternative precursors of fentanyl have no currently known legitimate uses, **INCB encourages Governments to be vigilant and cooperate with each other and with the Board in exchanging actionable information related to suspicious shipments, smuggling attempts or seizures involving suspected fentanyl precursors, preferably using PICS. The Board would also appreciate receiving evidence of the actual use of any of those chemicals in the illicit manufacture of fentanyl and fentanyl analogues.**

E. Substances not listed in Table I or Table II of the 1988 Convention that are used in the illicit manufacture of other narcotic drugs and psychotropic substances or substances of abuse not under international control

1. Precursors of GHB

184. **GBL** is a precursor used in the illicit manufacture of GHB but is also directly ingested and metabolized into GHB in the body. 1,4-Butanediol is another precursor of GBL and a pre-precursor of GHB, and is also readily converted to GHB upon its ingestion (see figure XVI).

Figure XVI. GBL and GHB



^aNot under international control but included in the limited international special surveillance list.

^bIncluded in Schedule II of the 1971 Convention.

185. As in the past, there were significant differences among countries in the amounts of GBL reported on form D for 2019, ranging from less than 1 kg (reported by Canada) to more than 25,000 kg (reported by Germany and Slovenia). According to authorities in Germany, GBL is sourced in Asia by companies in Germany and abroad, which resell the substance, as a cleaning agent, on the Internet to clients in Germany and other European countries for illicit purposes. Large seizures of GBL by customs authorities in Germany have provided further evidence of this modus operandi. In addition, for the first time in five years, Germany detected evidence of the user-based illicit manufacture of GHB from GBL.

186. The majority of seizures of GBL continued to be reported by countries in Europe. Countries outside Europe where GBL had been seized included Brazil, Canada, Chile and the United States. From other sources, including PICS, the Board is also aware of additional seizures of the substance in Australia and Hong Kong, China, in 2019. Although in most of the seizures made in Australia the substance had originated in China, including Hong Kong, the Netherlands was most frequently identified as the country of origin of the quantities seized in Europe and Chile. No seizures of **1,4-butanediol** were reported on form D for 2019.

2. Precursors of ketamine

187. There is no systematic reporting of information about ketamine precursors and the illicit manufacture of ketamine. From national reports and other official sources, INCB is aware of the dismantling of two clandestine ketamine laboratories in India, in Bangalore in May 2019 and in Chennai in June 2020. About 52 kg and 110 kg, respectively, of ketamine were seized. No information about the precursors used or their sources was available. The ketamine was destined for Malaysia.

3. Precursors of new psychoactive substances, including substances recently scheduled under the Single Convention on Narcotic Drugs of 1961 or the Convention on Psychotropic Substances of 1971

188. As in past years, on form D for 2019, a number of European countries reported seizures of precursors of new psychoactive substances and recently scheduled substances. The most frequently reported chemical was **2-bromo-4'-methylpropiophenone**, a mephedrone precursor, which was seized in amounts ranging from 1 kg to 120 kg in the Netherlands, Belgium, Germany and France (in descending order of amounts seized). Authorities in Germany also reported trans-shipments of more than 610 kg of the substance to countries in Eastern Europe.

189. Seizures of **2-bromo-4'-chloropropiophenone** (a precursor of various 4-chloro-substituted cathinone derivatives, such as 4-CMC (cplehedrone)), amounting to 300 kg were reported on form D for 2019 by Germany. The substance, as well as other cathinones precursors such as **2-bromo-4'-methoxypropiophenone** (a precursor of methedrone) were also communicated through PICS in the period 2019–2020. The vast majority of the incidents was communicated by PICS users in countries in Europe. Where such information was provided, the destinations were countries in Europe, most frequently Poland, and the last known countries of departure were China; including Hong Kong, China; and India. Shipments were usually trafficked by air.

190. INCB is also aware of the dismantling in the Russian Federation in 2019 and 2020 of clandestine laboratories of significant size that had been manufacturing *alpha*-pyrrolidinopentiophenone (*alpha*-PVP). A small-scale *alpha*-PVP laboratory containing equipment and unspecified precursors was also seized in Belarus, while a seizure of 50 kg of valerophenone, an *alpha*-PVP precursor, in Czechia was communicated through PICS.

191. Seizures of small amounts of precursors of *alpha*-PVP, namely *alpha*-bromovalerophenone and pyrrolidine, and other reagents required for the illicit synthesis of *alpha*-PVP were also reported on form D for 2019 by the authorities of Brazil.

192. The Board once again commends countries that voluntarily report seizures of precursors of new psycho-active substances and substances recently scheduled under the 1971 and 1961 Conventions, as such

reporting helps to identify emerging trends. To make the best possible use of available information and intelligence, all Governments are encouraged to communicate relevant incidents through PICS in real time.