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WCO Programme Global Shield (PGS) – E-book No. 10

[Training Material for Departmental Use]

E-BOOK

On

Identification

of

Precursor Chemicals

Identification of Precursor Chemicals

Note:

1. In this E-book, attempts have been made to explain as to how to *Identify Precursor Chemicals*. It is expected that it will help departmental officers in their day-to-day work.
2. Though all efforts have been made to make this document error free, but it is possible that some errors might have crept into the document. If you notice any errors, the same may be brought to the notice of the NACEN, RTI, Kanpur on the Email address: rtinacenkanpur@yahoo.co.in. This may not be a perfect E-book. If you have any suggestion to improve this book, you are requested to forward the same to us.
3. This e-book is one of the several e-books dealing with different aspects of WCO Programme Global Shield (PGS). The Programme Global Shield (PGS) is a long term law enforcement initiative of WCO alongwith its partner organizations, namely, United Nations Office on Drug and Crime (UNODC), International Police Organization (INTERPOL) and member countries. This Programme is aimed at combating the illicit diversion and trafficking of high risk precursor chemicals, which are commonly used by criminal elements/terrorist organizations to make Improvised Explosive Devices (IEDs).
4. It is acknowledged here that in preparing this e-book, the WCO training material as well as material from other sources including that available freely on internet have been used. Wherever possible, the source of material has been indicated in this e-book. It might be possible that for some material, we may not have specifically mentioned such source. This e-book is meant for education and training of Customs officers in India and is for non-commercial use. While it is not our intention to infringe any copyrights, if anybody has any issue with regard to any of the material used in this e-book, the same may kindly be brought to our notice on the email addresses mentioned above.
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INDEX

Abbreviations& Glossary..... 1

Identification of Precursor Chemicals 2

1. Introduction 2

1.1.1. Nitromethane 2

1.1.2. Sodium Nitrate 3

1.1.3. Potassium Nitrate..... 4

1.1.4. Sodium Chlorate 6

1.1.5. Potassium Cholrate 7

1.1.6. Potassium Perchlorate 8

1.1.7. Hydrogen Peroxide 9

1.1.8. Nitric Acid 10

1.1.9. Calcium Ammonium Nitrate..... 12

1.1.10. Aluminium Powder 13

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Abbreviations & Glossary

CAS No:	Chemical Abstract Service Number <i>[CAS numbers are used to provide a unique, unmistakable identifier for chemical substances and provide an unambiguous way to identify a chemical substance. A CAS No. is separated by hyphens into three parts—the first consisting from two to seven digits, the second consisting of two digits, and the third consisting of a single digit serving as a check digit].</i>
HS Code:	Harmonized Commodity Description and Coding System <i>[It is an internationally standardized system of names and numbers for classifying traded products. It has been developed and maintained by the WCO. It is based on HS Convention.]</i>
IED:	Improvised Explosive Devices
MSDS:	Material Safety Data Sheet (MSDS) <i>[It is documents provided by the manufacturer that contain information on physical and chemical properties of material, potential hazards of the material, and how to work safely with hazardous substances. They also contain information on the use, storage, handling, and emergency procedures related to hazards of the material. All MSDSs contain eight (8) sections, but most of them contain additional sections]</i>
PGS:	Programme Global Shield (WCO Programme for prevention of smuggling and diversion of Precursor Chemicals, commonly used for manufacture of IEDs)
UN Code:	United Nation Number <i>[UN numbers, or UN IDs, are four-digit numbers that identify hazardous substances and articles (such as explosives, flammable liquids, toxic substances, etc.).]</i>
UNCETDG:	United Nations Committee of Experts on the Transport of Dangerous Goods
WCO:	World Custom Organisation

Identification of Precursor Chemicals

1. Introduction

1.1 Programme Global Shield focuses on 14 high risk precursor chemicals, identified by industry experts as posing the greatest threat of use in IEDs. Out of 14 precursor Chemicals for IEDs, important details about 10 precursor chemicals have been given below in this E-book. For knowing about the remaining four precursor chemicals, please refer to specific e-books on Ammonium Nitrate, Urea, Acetic Anhydride and Acetone. Further, to know more about signal words, hazard statement and precautionary statement, please refer to Purple Book containing recommendations of UN Committee of Experts on Globally Harmonized System of classification and labeling of Chemicals (UNCEGHS). For knowing more about Pictograms, both work place and transport, please refer to E-books on UN Recommendations on Classification, labeling and Transport of Hazardous Materials.

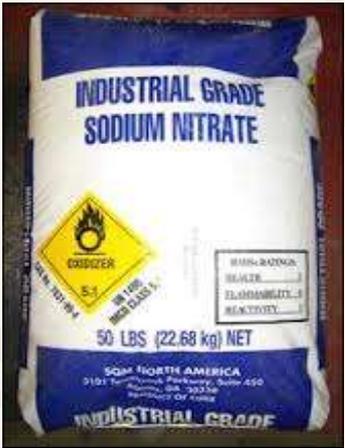
1.1.1. Nitromethane

NITROMEHTANE	Specification	Details
	Chemical Formula	CH ₃ NO ₂
	Alternative names	Nitrocarbol
	CAS No	75-52-5
	HS No	290420
	UN No	1261
	Appearance	Colour less liquid
Uses	<ul style="list-style-type: none"> • Industrial solvent, • Cleaning solvent, pharmaceuticals, • Pesticides, • Explosives, • Fibers coatings • Racing fuel, • Dry cleaning, • Degreaser, • Solvent for superglue 	
UN Transport Pictogram		

Identification of Precursor Chemicals

	GHS Pictogram	
	Signal Word	Warning
	Hazard Statement	H 226: Flammable Liquid and Vapour
		H 302: Harmful if swallowed
		H 402: Harmful to Aquatic life
Precautionary Statement	P210: Keep away from heat/sparks/open flames/hot surfaces.	
	P233: Keep container tightly closed	

1.1.2. Sodium Nitrate

SODIUM NITRATE	Specification	Details
	Chemical Formula	NaNO ₃
	Alternative names	<ul style="list-style-type: none"> • Caliche, • Chile Saltpeter
	CAS No	7631-99-4
	HS No	310250
	UN No	1498
	Appearance	White Powder or colourless crystals
	Uses	<ul style="list-style-type: none"> • Color fixative • preservative in meats and fish, • dyeing and printing textile fabrics and • bleaching fibers, • manufacture of rubber • chemicals, • corrosion inhibitor

Identification of Precursor Chemicals

 	UN Transport Pictogram	
	GHS Pictogram	
	Signal Word	Warning
	Hazard Statement	H272 May intensify fire; oxidizer.
		H302 Harmful if swallowed.
		H315 Causes skin irritation.
H319 Causes serious eye irritation.		
Precautionary Statement	H335 May cause respiratory irritation.	
	<p>P220: Keep/Store away from clothing/ combustible materials.</p> <p>P261: Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.</p> <p>P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p>	

1.1.3. Potassium Nitrate

POTASSIUM NITRATE	Specification	Details
	Chemical Formula	KNO ₃
	Alternative names	<ul style="list-style-type: none"> • Saltpeter, • Nitrate of Potash, • Vesta Powder
	CAS No	7757-79-1
	HS No	283421
	UN No	1486
	Appearance	White Solid

Identification of Precursor Chemicals

	Uses	<ul style="list-style-type: none"> • Fertilizers, • rocket propellants, • fireworks, • food additive, • pre-rolled cigarettes, • tree stump remover
	UN Transport Pictogram	
	GHS Pictogram	
	Signal Word	Warning
	Hazard Statement	H272 - May intensify fire; oxidiser H315 - Causes skin irritation H319 - Causes serious eye irritation H335 - May cause respiratory irritation
	Precautionary Statement	P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking P220 - Keep/Store away from clothing, combustible materials P221 - Take any precaution to avoid mixing with combustibles P261 - Avoid breathing dust P264 - Wash exposed skin thoroughly after handling P271 - Use only outdoors or in a well-ventilated area P280 - Wear eye protection, protective clothing, protective gloves, face protection P302+P352 - IF ON SKIN: Wash with plenty of soap and water P304+P340 - IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P312 - Call a POISON CENTER/doctor/physician if you feel unwell P332+P313 - If skin irritation occurs: Get medical advice/attention P337+P313 - If eye irritation persists: Get medical advice/attention

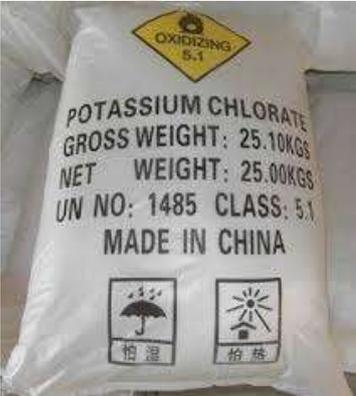
1.1.4. Sodium Chlorate

Sodium Chlorate	Specification	Details
  	Chemical Formula	NaClO ₃
	Alternative names	-
	CAS No	7775-09-9
	HS No	282911
	UN No	1495
	Appearance	White Solid, soluble in Water and Hygroscopic.
	Uses	Herbicide, defoliant desiccant
	UN Transport Pictogram	
	GHS Pictogram	
	Signal Word	Danger
Hazard Statement	H 271: May cause fire or explosion; strong oxidizer. H301: Toxic if swallowed. H318: Causes serious eye irritation. H331: Toxic if inhaled. H335: May cause respiratory irritation	
Precautionary Statement	Prevention P210: Keep away from heat. P220: Keep away from clothing and other combustible materials. P221: Take any precaution to avoid mixing with combustibles. P261: Avoid breathing dust/fume. P264: Wash thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in a well-ventilated area. P280: Wear protective gloves/eye	

Identification of Precursor Chemicals

		<p>protection/face protection.</p> <p>Response</p> <p>P301: If swallowed: Immediately call a poison center/doctor.</p> <p>P304: If inhaled: Remove person to fresh air and keep comfortable for breathing.</p> <p>P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P337 + P313: If eye irritation persists: Get medical advice/attention.</p> <p>P306+P360: If on clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.</p> <p>P370+ P378: In case of fire: Use appropriate water only to extinguish.</p> <p>P371+ P380+ P375: In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.</p> <p>Storage</p> <p>P401: Store in cool dry fireproof area. Keep away from combustible or readily oxidizable materials and acids.</p> <p>Disposal</p> <p>P501: Dispose of contents/container in accordance with local/regional/national/international regulations.</p>
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1.1.5. Potassium Chlorate

Potassium Chlorate	Specification	Details
	Chemical Formula	KClO ₃
	Alternative names	Potcrate
	CAS No	3811-04-9
	HS No	282919
	UN No	1485
	Appearance	White Crystals or Powder

Identification of Precursor Chemicals

	Uses	<ul style="list-style-type: none"> Disinfectant, Safety matches, Explosives Fireworks, Oxidizing agent, Pesticide
	UN Transport Pictogram	
	GHS Pictogram	
	Signal Word	Danger
	Hazard Statement	<p>H271: May Cause Fire or explosion: Strong Oxidiser</p> <p>H302: Harmful if swallowed</p> <p>H332: Harmful if inhaled.</p> <p>H411: Toxic to aquatic life with long lasting effect.</p>
Precautionary Statement	<p>P220: Keep/Store Away from Clothing/ Combustible material</p> <p>P273: Avoid Release to the environment.</p>	

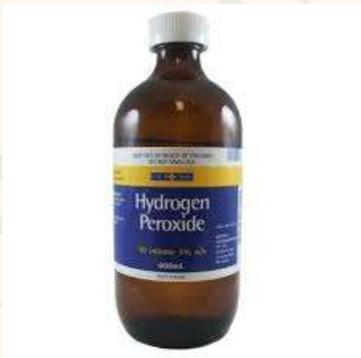
1.1.6. Potassium Perchlorate

Potassium Perchlorate	Specification	Details
	Chemical Formula	KClO ₄
	Alternative names	<ul style="list-style-type: none"> Potassium chlorate, Perchloric acid, potassium salt peroidin
	CAS No	7778-74-7
	HS No	282990
	UN No	1489

Identification of Precursor Chemicals

 	Appearance	Colorless/white crystalline powder
	Uses	Fireworks, ammunition percussion caps, explosive primers, propellants, flash compositions, stars, sparklers
	UN Transport Pictogram	
	GHS Pictogram	
	Signal Word	Danger
	Hazard Statement	H 271 : May cause fire or explosion; strong oxidiser H302 : Harmful if swallowed
	Precautionary Statement	P 220 : Keep /Store away from clothing /combustible materials

1.1.7. Hydrogen Peroxide

Hydrogen Peroxide	Specification	Details
	Chemical Formula	H ₂ O ₂
	Alternative names	Dioxidane, Oxidanyl
	CAS No	7722-84-1
	HS No	284700
	UN No	2014: -Hydrogen Peroxide in aqueous solution more than 40% but less than 60% H ₂ O ₂ 2015: -Hydrogen Peroxide in aqueous solution more than 60% H ₂ O ₂ 2984: -Hydrogen Peroxide in aqueous solution not less than 8% but less than 20% H ₂ O ₂
	Appearance	Pale Blue Liquid

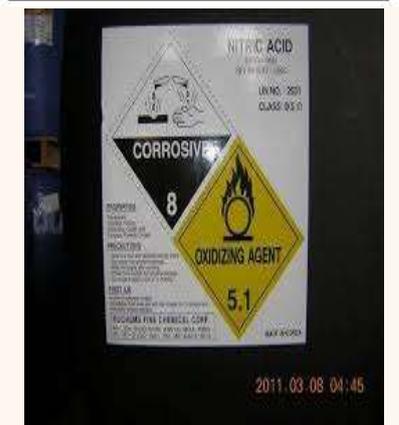
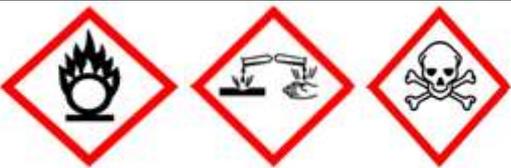
Identification of Precursor Chemicals

	Uses	<ul style="list-style-type: none"> • Bleach, • disinfectant, • Antiseptic, • Oxidizer
	UN Transport Pictogram	
	GHS Pictogram	
	Signal Word	Danger
	Hazard Statement	H271 May cause fire or explosion; strong oxidizer H302 Harmful if swallowed H314 Causes severe skin burns and eye damage H333 May be harmful if inhaled H402 Harmful to aquatic life
	Precautionary Statement	P220 Keep/store away from clothing/combustible materials. P280 Wear protective gloves/protective clothing/eye protection/face protection P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing. P310 Immediately call a POISON CENTER or doctor/physician.

1.1.8. Nitric Acid

Nitric Acid	Specification	Details
	Chemical Formula	HNO ₃
	Alternative names	<ul style="list-style-type: none"> • Aqua fortis, • Salpêtreacid, • Spirit of nitre • Hydrogen Nitrate
	CAS No	7697-37-2, 43625-06-5, 13587-52-5
	HS No	280800

Identification of Precursor Chemicals

	<p>UN No</p>	<p>1796: Nitrating Acid Mixture with more than 50% nitric acid</p> <p>1826: Nitrating Acid mixtures, spent with more than 50 percent nitric acid or Nitrating acid mixtures, spent with not more than 50 percent nitric acid</p> <p>2031: Nitric Acid other than red fuming</p> <p>2032: Nitric Acid with red fuming</p>
	<p>Appearance</p>	<p>Clear colour Less liquid</p>
 <p style="text-align: center;">Fuming Nitric Acid</p>	<p>Uses</p>	<ul style="list-style-type: none"> • Fertilizers, • purification and extraction of gold, • chemical synthesis
	<p>UN Transport Pictogram</p>	
	<p>GHS Pictogram</p>	
	<p>Signal Word</p>	<p>Danger</p>
	<p>Hazard Statement</p>	<p>H272: May Intensify fire; oxidizer category 2</p> <p>H290: Corrosive to Metals</p> <p>H300: Acute Toxicity, Oral, Category 1</p> <p>H304: Aspiration Hazard, Category 1</p> <p>H312: Acute Toxicity, Dermal, Category 4</p> <p>H314: Skin/Corrosion/Irritation, Category 1</p> <p>H332: Acute Toxicity, Inhalation, Category 4</p>
	<p>Precautionary Statement</p>	<p>P210: Keep away from heat</p> <p>P220: Keep/store away from combustibles</p> <p>P221: Take precautions to avoid mixing with combustibles</p> <p>P280: Wear protective gloves/eye/face protection.</p> <p>P370 & P378: In case of fire, Use water in flooding quantities as fog on adjacent fires</p> <p>P501: Dispose of contents/containers in accordance with local/regional national and international regulations</p>

1.1.9. Calcium Ammonium Nitrate

Calcium Ammonium Nitrate	Specification	Details
 	Chemical Formula	$5\text{Ca}(\text{NO}_3)_2 \cdot \text{NH}_4\text{NO}_3 \cdot 10\text{H}_2\text{O}$
	Alternative names	Caliche, Chile Saltpeter CAN
	CAS No	15245-12-2
	HS No	310260
	UN No	Not considered Hazardous from Transportation point
	Appearance	White Solid. It is hygroscopic. It's dissolution in water is endothermic, therefore, used in instant cold packs.
	Uses	Fertilizer Instant Cold Packs
	UN Transport Pictogram	Nil
	GHS Pictogram	
	Signal Word	Warning
Hazard Statement	H272: May intensify fire; oxidizer H303: May be harmful if swallowed H316: Causes mild skin irritation H320: Causes eye irritation	
Precautionary Statement	P220: Keep/store away from clothing/combustible materials. P305+P351+P338: IF EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	

1.1.10. Aluminium Powder

Aluminum Powder	Specification	Details
 <p>Aluminium Powder</p>  <p>Aluminium Flakes</p>	Chemical Formula	Al
	Alternative names	-
	CAS No	7429-90-5
	HS No	760320 (flakes) 760310 (Powder)
	UN No	1396
	Appearance	Silver Grey Powder
	Uses	<ul style="list-style-type: none"> Used in various applications of pyrotechnics, including the creation of fireworks displays, creation of wooden furniture and floors
	UN Transport Pictogram	
	GHS Pictogram	
	Signal Word	Danger
Hazard Statement	<p>H228: Highly flammable solid.</p> <p>H261: In contact with water releases flammable gas.</p>	
Precautionary Statement	<p>P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.</p> <p>P231+P232: Handle under inert gas. Protect from moisture.</p> <p>P240: Ground/bond container and receiving equipment.</p> <p>P241: Use explosion-proof electrical, ventilating, lighting, ..., equipment.</p> <p>P210: Keep away from heat, sparks, open flames or hot surfaces. – No smoking.</p> <p>P280: Wear protective gloves, protective clothing, eye protection, face protection.</p> <p>P233: Keep container tightly closed.</p>	
