# 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 | CH3NO2 |
| | Alternative names | Nitrocarbol |
| | CAS No | 75-52-5 |
| | HS No | 290420 |
| | UN No | 1261 |
| | Appearance | Colour less liquid |
| | Uses | • Industrial solvent,<br>• Cleaning solvent, pharmaceuticals,<br>• Pesticides,<br>• Explosives,<br>• Fibers coatings<br>• Racing fuel,<br>• Dry cleaning,<br>• Degreaser,<br>• Solvent for superglue |
| | UN Transport Pictogram |  |

| | | |
|---|---|---|
|  <br>  | 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 | NaNO3 |
| | Alternative names | • Caliche,<br>• Chile Saltpeter |
| | CAS No | 7631-99-4 |
| | HS No | 310250 |
| | UN No | 1498 |
| | Appearance | White Powder or colourless crystals |
| | Uses | • Color fixative<br>• preservative in meats and fish,<br>• dyeing and printing textile fabrics and<br>• bleaching fibers,<br>• manufacture of rubber<br>• chemicals,<br>• corrosion inhibitor |

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|---|---|---|
|  <br>  | 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. |
| | | H335 May cause respiratory irritation. |
| | Precautionary Statement | P220: Keep/Store away from clothing/ combustible materials.<br>P261: Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.<br>P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |

## 1.1.3. Potassium Nitrate

| POTASSIUM NITRATE | Specification | Details |
|---|---|---|
|  | Chemical Formula | KNO3 |
| | Alternative names | • Saltpeter,<br>• Nitrate of Potash,<br>• Vesta Powder |
| | CAS No | 7757-79-1 |
| | HS No | 283421 |
| | UN No | 1486 |
| | Appearance | White Solid |


| | |
|---|---|
| Uses | • Fertilizers,<br>• rocket propellants,<br>• fireworks,<br>• food additive,<br>• pre-rolled cigarettes,<br>• tree stump remover |
| UN Transport Pictogram |   |
| GHS Pictogram |  |
| Signal Word | Warning |
| Hazard Statement | H272 - May intensify fire; oxidiser<br>H315 - Causes skin irritation<br>H319 - Causes serious eye irritation<br>H335 - May cause respiratory irritation |
| Precautionary Statement | P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking<br>P220 - Keep/Store away from clothing, combustible materials<br>P221 - Take any precaution to avoid mixing with combustibles<br>P261 - Avoid breathing dust<br>P264 - Wash exposed skin thoroughly after handling<br>P271 - Use only outdoors or in a well-ventilated area<br>P280 - Wear eye protection, protective clothing, protective gloves, face protection<br>P302+P352 - IF ON SKIN: Wash with plenty of soap and water<br>P304+P340 - IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing<br>P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing<br>P312 - Call a POISON CENTER/doctor/physician if you feel unwell<br>P332+P313 - If skin irritation occurs: Get medical advice/attention<br>P337+P313 - If eye irritation persists: Get medical advice/attention |

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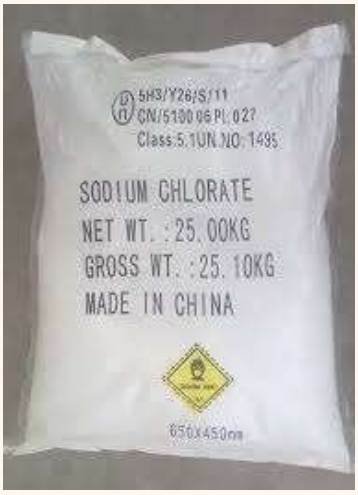
## 1.1.4. Sodium Chlorate

| 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,<br>defoliant<br>desiccant |
| | UN Transport Pictogram |  |
| | GHS Pictogram |  |
| | Signal Word | Danger |
| | Hazard Statement | H 271: May cause fire or explosion; strong oxidizer.<br>H301: Toxic if swallowed.<br>H318: Causes serious eye irritation.<br>H331: Toxic if inhaled.<br>H335: May cause respiratory irritation |
| | Precautionary Statement | **Prevention**<br>P210: Keep away from heat.<br>P220: Keep away from clothing and other combustible materials.<br>P221: Take any precaution to avoid mixing with combustibles.<br>P261: Avoid breathing dust/fume.<br>P264: Wash thoroughly after handling.<br>P270: Do not eat, drink or smoke when using this product.<br>P271: Use only outdoors or in a well-ventilated area.<br>P280: Wear protective gloves/eye |

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

## 1.1.5. Potassium Chlorate

| Potassium Chlorate | Specification | Details |
|---|---|---|
|  | Chemical Formula | KCLO3 |
| | Alternative names | Potcrate |
| | CAS No | 3811-04-9 |
| | HS No | 282919 |
| | UN No | 1485 |
| | Appearance | White Crystals or Powder |

| | | |
|---|---|---|
|  | Uses | • Disinfectant,<br>• Safety matches,<br>• Explosives<br>• Fireworks,<br>• Oxidizing agent,<br>• Pesticide |
| | UN Transport Pictogram |  |
| | GHS Pictogram |  |
| | Signal Word | Danger |
| | Hazard Statement | H271: May Cause Fire or explosion: Strong Oxidiser<br>H302: Harmful if swallowed<br>H332: Harmful if inhaled.<br>H411: Toxic to aquatic life with long lasting effect. |
| | Precautionary Statement | P220: Keep/Store Away from Clothing/ Combustible material<br>P273: Avoid Release to the environment. |

## 1.1.6. Potassium Percholorate

| Potassium Perchlorate | Specification | Details |
|---|---|---|
|  | Chemical Formula | KCLO4 |
| | Alternative names | • Potassium chlorate,<br>• Perchloric acid,<br>• potassium salt<br>• peroidin |
| | CAS No | 7778-74-7 |
| | HS No | 282990 |
| | UN No | 1489 |


| | |
|---|---|
| Appearance | Colorless/white crystalline powder |
| Uses | Fireworks,<br>ammunition percussion caps,<br>explosive primers,<br>propellants,<br>flash compositions,<br>stars, sparklers |
| UN Transport Pictogram |  |
| GHS Pictogram |  |
| Signal Word | Danger |
| Hazard Statement | H 271 : May cause fire or explosion; strong oxidiser<br>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 | H2O2 |
| | 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% H2O2<br>**2015:**-Hydrogen Peroxide in aqueous solution more than 60% H2O2<br>**2984:**-Hydrogen Peroxide in aqueous solution not less than 8% but less than 20% H2O2 |
| | Appearance | Pale Bule Liquid |

| | | |
|---|---|---|
|  | Uses | • Bleach,<br>• disinfectant,<br>• Antiseptic,<br>• Oxidizer |
| | UN Transport Pictogram |   |
| | GHS Pictogram |  |
| | Signal Word | Danger |
| | Hazard Statement | H271 May cause fire or explosion; strong oxidizer<br>H302 Harmful if swallowed<br>H314 Causes severe skin burns and eye damage H333 May be harmful if inhaled<br>H402 Harmful to aquatic life |
| | Precautionary Statement | P220 Keep/store away from clothing/combustible materials.<br>P280 Wear protective gloves/protective clothing/eye protection/face protection<br>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.<br>P310 Immediately call a POISON CENTER or doctor/physician. |

### 1.1.8. Nitric Acid

| Nitric Acid | Specification | Details |
|---|---|---|
|  | Chemical Formula | HNO3 |
| | Alternative names | • Aqua fortis,<br>• Salpetreacid,<br>• Spirit of nitre<br>• Hydrogen Nitrate |
| | CAS No | 7697-37-2,<br>43625-06-5,<br>13587-52-5 |
| | HS No | 280800 |



Fuming Nitric Acid

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|---|---|
| UN No | 1796: Nitrating Acid Mixture with more than 50% nitric acid<br>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<br>2031: Nitric Acid other than red fuming<br>2032: Nitric Acid with red fuming |
| Appearance | Clear colour Less liquid |
| Uses | • Fertilizers,<br>• purification and extraction of gold,<br>• chemical synthesis |
| UN Transport Pictogram |   |
| GHS Pictogram |  |
| Signal Word | Danger |
| Hazard Statement | H272: May Intensify fire; oxidizer category 2 H290: Corrosive to Metals<br>H300: Acute Toxicity, Oral, Category 1<br>H304: Aspiration Hazard, Category 1<br>H312: Acute Toxicity, Dermal, Category 4<br>H314:Skin/Corrosion/Irritation, Category 1<br>H332: Acute Toxicity, Inhalation, Category 4 |
| Precautionary Statement | P210: Keep away from heat<br>P220: Keep/store away from combustibles<br>P221: Take precautions to avoid mixing with combustibles<br>P280: Wear protective gloves/eye/face protection.<br>P370 & P378: In case of fire, Use water in flooding quantities as fog on adjacent fires<br>P501: Dispose of contents/containers in accordance with local/regional national and international regulations |

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## 1.1.9. Calcium Ammonium Nitrate

| Calcium Ammonium Nitrate | Specification | Details |
|---|---|---|
|   | Chemical Formula | 5Ca(NO3)2 ·NH4NO3·10H2O |
| | Alternative names | Caliche,<br>Chile Saltpeter<br>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<br>Instant Cold Packs |
| | UN Transport Pictogram | Nil |
| | GHS Pictogram |  |
| | Signal Word | Warning |
| | Hazard Statement | H272: May intensify fire; oxidizer<br>H303: May be harmful if swallowed<br>H316: Causes mild skin irritation<br>H320: Causes eye irritation |
| | Precautionary Statement | P220: Keep/store away from clothing/combustible materials.<br>P305+P351+P338:IF EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |

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## 1.1.10. Aluminium Powder

| Aluminum Powder | Specification | Details |
|---|---|---|
|  <br>Aluminium Powder<br>  <br>Aluminium Flakes | Chemical Formula | Al |
| | Alternative names | - |
| | CAS No | 7429-90-5 |
| | HS No | 760320 (flakes)<br>760310 (Powder) |
| | UN No | 1396 |
| | Appearance | Silver Grey Powder |
| | Uses | • Used in various applications of pyrotechnics, including the creation of fireworks displays,<br>• creation of wooden furniture and floors |
| | UN Transport Pictogram |  |
| | GHS Pictogram |  |
| | Signal Word | Danger |
| | Hazard Statement | **H228:** Highly flammable solid.<br>**H261:** In contact with water releases flammable gas. |
| | Precautionary Statement | **P223:** Keep away from any possible contact with water, because of violent reaction and possible flash fire.<br>**P231+P232:** Handle under inert gas. Protect from moisture.<br>**P240:** Ground/bond container and receiving equipment.<br>**P241:** Use explosion-proof electrical, ventilating, lighting, …, equipment.<br>**P210:** Keep away from heat, sparks, open flames or hot surfaces. – No smoking.<br>**P280:** Wear protective gloves, protective clothing, eye protection, face protection.<br>**P233:** Keep container tightly closed. |

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