Petrol
Incident Management

Key Points

Fire
- highly flammable
- vapour/air mixtures are explosive; low flash point
- in the event of a fire involving petrol, use normal foam and normal fire kit with breathing apparatus

Health
- systemic toxicity most commonly occurs after exposure by inhalation, although it may occur following ingestion or rarely after skin contact
- ingestion causes nausea, vomiting and abdominal pain
- aspiration into the lungs causes pneumonitis; features may progress over 24–48 hours
- inhalation may cause nausea, vomiting, headache, dizziness, respiratory tract irritation, euphoria, delirium, tremor, lethargy, ataxia and drowsiness
- systemic symptoms include drowsiness, lethargy, ataxia, convulsions, cardiac arrhythmias, coma and respiratory collapse
- dermal exposure can cause irritation, drying and cracking. There may be transient pain with erythema and blistering; rarely systemic toxicity may arise
- ocular exposure may cause irritation to the eyes with, stinging, burning and lacrimation

Environment
- avoid release to the environment; inform the Environment Agency where appropriate
Hazard Identification

Standard (UK) dangerous goods emergency action codes

<table>
<thead>
<tr>
<th>UN</th>
<th>1203</th>
<th>Motor spirit, gasoline or petrol</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAC</td>
<td>3YE</td>
<td>Use normal foam. Wear normal fire kit in combination with breathing apparatus*. Danger that the substance can be violently or explosively reactive. Spillages and decontamination run-off should be prevented from entering drains and watercourses. There may be a public safety hazard outside the immediate area of the incident†</td>
</tr>
<tr>
<td>APP</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Hazards</td>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Sub-risks</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>HIN</td>
<td>33</td>
<td>Highly flammable liquid (flashpoint below 23°C)</td>
</tr>
</tbody>
</table>

UN – United Nations number, EAC – emergency action code, APP – additional personal protection, HIN – hazard identification number

* Normal firefighting clothing is appropriate, i.e. breathing apparatus conforming to BS EN 137 worn in combination with fire kit conforming to BS EN 469, firefighters’ gloves conforming to BS EN 659 and firefighters’ boots conforming to Home Office specification A29 or A30

† People should stay indoors with windows and doors closed, ignition sources should be eliminated and ventilation stopped. Non-essential personnel should move at least 250 m away from the incident

Reference

## Classification, labelling and packaging (CLP)*

<table>
<thead>
<tr>
<th>Hazard class and category</th>
<th>Hazard statement</th>
<th>Signal words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asp. Tox. 1</td>
<td>Aspiration hazard, category 1</td>
<td>DANGER</td>
</tr>
<tr>
<td>Muta. 1B</td>
<td>Germ cell mutagenicity, category 1B</td>
<td></td>
</tr>
<tr>
<td>Carc. 1B</td>
<td>Carcinogenicity, category 1B</td>
<td></td>
</tr>
</tbody>
</table>

* Implemented in the EU on 20 January 2009

**Reference**

<table>
<thead>
<tr>
<th><strong>Physicochemical Properties</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAS number</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Molecular weight</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Formula</strong></td>
<td>Mixture of C₄ to C₁₂ hydrocarbons</td>
</tr>
<tr>
<td><strong>Common synonyms</strong></td>
<td>Gasoline</td>
</tr>
<tr>
<td><strong>State at room temperature</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
<td>Vapour pressure 304–684 mmHg at 37.8°C</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>Liquid: 0.7–0.8 (water = 1)</td>
</tr>
<tr>
<td><strong>Relative vapour density</strong></td>
<td>Vapour: 3–4 (air = 1)</td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td>Highly flammable</td>
</tr>
<tr>
<td><strong>Water solubility</strong></td>
<td>Insoluble in water</td>
</tr>
<tr>
<td><strong>Reactivity</strong></td>
<td>Low flashpoint. Vapour/air mixtures are explosive</td>
</tr>
<tr>
<td><strong>Reaction or degradation products</strong></td>
<td>–</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>Characteristic odour</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>–</td>
</tr>
</tbody>
</table>

**References**


Reported Effect Levels from Authoritative Sources

Data not available
Published Emergency Response Guidelines

Emergency response planning guideline (ERPG) values

| ERPG-1* | 200<sup>(1)</sup> | – |
| ERPG-2† | 1,000 | – |
| ERPG-3‡ | 4,000<sup>(2)</sup> | – |

* Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odour.
† Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual’s ability to take protective action.
‡ Maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

<sup>(1)</sup> Odour should be detectable near ERG-1
<sup>(2)</sup> Between 10% and 49% of the lower explosive limit (LEL), where the LEL is 14,000 ppm

Reference

Acute exposure guideline levels (AEGLs)

| AEGL-1* | No data available |
| AEGL-2† | |
| AEGL-3‡ | |

* Level of the chemical in air at or above which the general population could experience notable discomfort.
† Level of the chemical in air at or above which there may be irreversible or other serious long-lasting effects or impaired ability to escape.
‡ Level of the chemical in air at or above which the general population could experience life-threatening health effects or death.
Exposure Standards, Guidelines or Regulations

Occupational standards

<table>
<thead>
<tr>
<th></th>
<th>LTEL (8-hour reference period)</th>
<th>STEL (15-min reference period)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ppm mg/m³</td>
<td>ppm mg/m³</td>
</tr>
<tr>
<td>WEL</td>
<td>Data not available</td>
<td></td>
</tr>
</tbody>
</table>

WEL – workplace exposure limit, LTEL – long-term exposure limit, STEL – short-term exposure limit

Public health guidelines

<table>
<thead>
<tr>
<th>Standard</th>
<th>Guideline Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking water standard</td>
<td>No guideline values specified</td>
</tr>
<tr>
<td>Air quality guideline</td>
<td>No guideline values specified</td>
</tr>
<tr>
<td>Soil guideline values and health criteria values</td>
<td>No guideline values specified</td>
</tr>
</tbody>
</table>
Health Effects

Major route of exposure

- systemic toxicity most commonly occurs after exposure by inhalation; it may occur following ingestion, but rarely after skin contact
- pulmonary toxicity is most likely to occur following ingestion (due to aspiration)

Immediate signs or symptoms of acute exposure

<table>
<thead>
<tr>
<th>Route</th>
<th>Signs and symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Inhalation may cause nausea, vomiting, headache, dizziness, respiratory tract irritation, euphoria, delirium, tremor, lethargy, ataxia and drowsiness. In severe cases, renal impairment, non-cardiogenic pulmonary oedema, haemolytic anaemia, amnesia, coma, convulsions and cardiopulmonary arrest may occur. There may be sudden death due to cardiac arrhythmias (in particular, ventricular fibrillation), which appear to be due to sensitisation of the myocardium to catecholamines. Direct inhalation of aerosols may cause death due to bradycardia and cardiac arrest.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Nausea, vomiting and abdominal pain may occur. Rarely, diarrhoea, haematemesis and melaena can occur. Aspiration into the lungs causes pneumonitis with initial choking, gasping, coughing and haemoptysis. Signs and symptoms may progress over 24–48 hours with wheeze, breathlessness, hyperventilation, dyspnoea, tachypnoea, bronchospasm, hypoxia, cyanosis, fever and leukocytosis. Pulmonary oedema may occur (may be delayed for 24–72 hours). In severe cases, shock and cardiorespiratory arrest can occur.</td>
</tr>
<tr>
<td>Systemic</td>
<td>Symptoms include drowsiness, lethargy, ataxia, convulsions, cardiac arrhythmias, coma and respiratory collapse. In rare cases, elevated LFTs, renal failure, intravascular haemolysis and disseminated intravascular coagulation may occur.</td>
</tr>
<tr>
<td>Dermal</td>
<td>Dermal exposure can cause irritation, drying and cracking due to defatting action. There may be transient pain with erythema, blistering, necrosis, partial thickness burns and possibly full thickness burns. Rarely, systemic toxicity may arise.</td>
</tr>
<tr>
<td>Ocular</td>
<td>Ocular exposure may cause irritation to the eyes, causing an immediate stinging and burning sensation with lacrimation.</td>
</tr>
</tbody>
</table>

References

Decontamination at the Scene

Summary
The approach used for decontamination at the scene will depend upon the incident, location of the casualties and the chemicals involved. Therefore, a risk assessment should be conducted to decide on the most appropriate method of decontamination.

Following disrobe, improvised dry decontamination should be considered for an incident involving petrol unless casualties are demonstrating signs or symptoms of exposure to caustic or corrosive substances.

Emergency services and public health professionals can obtain further advice from Public Health England (Centre for Radiation, Chemical and Environmental Hazards) using the 24-hour chemical hotline number: 0344 892 0555.

Disrobe
The disrobe process is highly effective at reducing exposure to HAZMAT/CBRN material when performed within 15 minutes of exposure.

Therefore, disrobe must be considered the primary action following evacuation from a contaminated area.

Where possible, disrobe at the scene should be conducted by the casualty themselves and should be systematic to avoid transferring any contamination from clothing to the skin. Consideration should be given to ensuring the welfare and dignity of casualties as far as possible.

Improvised decontamination
Improvised decontamination is an immediate method of decontamination prior to the use of specialised resources. This should be performed on all contaminated casualties, unless medical advice is received to the contrary. Improvised dry decontamination should be considered for an incident involving chemicals unless the agent appears to be corrosive or caustic.

Improvised dry decontamination
- any available dry absorbent material can be used such as kitchen towel, paper tissues (eg blue roll) and clean cloth
- exposed skin surfaces should be blotted and rubbed, starting with the face, head and neck and moving down and away from the body
- rubbing and blotting should not be too aggressive, or it could drive contamination further into the skin
• all waste material arising from decontamination should be left in situ, and ideally bagged, for disposal at a later stage

Improvised wet decontamination
• water should only be used for decontamination where casualty signs and symptoms are consistent with exposure to caustic or corrosive substances such as acids or alkalis
• wet decontamination may be performed using any available source of water such as taps, showers, fixed installation hose-reels and sprinklers
• when using water, it is important to try and limit the duration of decontamination to between 45 and 90 seconds and, ideally, to use a washing aid such as cloth or sponge
• improvised decontamination should not involve overly aggressive methods to remove contamination as this could drive the contamination further into the skin
• where appropriate, seek professional advice on how to dispose of contaminated water and prevent run-off going into the water system

Additional notes
• following improvised decontamination, remain cautious and observe for signs and symptoms in the decontaminated person and in unprotected staff
• if water is used to decontaminate casualties this may be contaminated, and therefore hazardous, and a potential source of further contamination spread
• all materials (paper tissues etc) used in this process may also be contaminated and, where possible, should not be used on new casualties
• the risk from hypothermia should be considered when disrobe and any form of wet decontamination is carried out
• people who are contaminated should not eat, drink or smoke before or during the decontamination process and should avoid touching their face
• consideration should be given to ensuring the welfare and dignity of casualties as far as possible. Immediately after decontamination the opportunity should be provided to dry and dress in clean robes/clothes
• people who are processed through improvised decontamination should subsequently be moved to a safe location, triaged and subject to health and scientific advice. Based on the outcome of the assessment, they may require further decontamination

Interim wet decontamination
Interim decontamination is the use of standard fire and rescue service (FRS) equipment to provide a planned and structured decontamination process prior to the availability of purpose-designed decontamination equipment.
Decontamination at the scene references


Clinical Decontamination and First Aid

Clinical decontamination is the process where trained healthcare professionals using purpose-designed decontamination equipment treat contaminated people individually.

Detailed information on clinical management can be found on TOXBASE – www.toxbase.org.

Important note

- ambulance staff, paramedics and emergency department staff treating chemically contaminated casualties should be equipped with appropriate personal protective equipment (PPE)

Clinical decontamination following surface contamination

- carry out decontamination in a well-ventilated area, preferably with its own ventilation system
- the patient should remove soiled clothing and wash themselves if possible
- put soiled clothing in a sealed container to prevent escape of volatile substances
- wash hair and all contaminated skin with liberal amounts of water (preferably warm) and soap
- pay special attention to skin folds, fingernails and ears

Dermal exposure

- decontaminate (as above) the patient following surface contamination
- for extensive or prolonged exposure there may be systemic effects – see ingestion
- burns totalling more than 15% of body surface area in adults (more than 10% in children) will require standard fluid resuscitation as for thermal burns
- cover affected area with a clean, non-adherent dressing
- chemical burns should be reviewed by a burns specialist; excision or skin grafting may be required
- other supportive measures as indicated by the patient's clinical condition

Ocular exposure

- if symptomatic, immediately irrigate the affected eye thoroughly
- for patients at home, use lukewarm tap water, trickled into the eye or in a small cup held over the eye socket; an eye dropper is an alternative
- in hospital, 1,000 mL 0.9% saline at room temperature by an infusion bag with a giving set is appropriate, irrigate for 10–15 minutes
• refer for ophthalmological assessment if there is doubt regarding the management of corneal damage
• other supportive measures as indicated by the patient’s clinical condition

Inhalation
• maintain a clear airway and adequate ventilation
• give oxygen if indicated
• monitor pulse, blood pressure, oxygen saturation, conscious level and respiratory rate
• perform a 12 lead ECG and monitor cardiac rhythm
• other supportive measures as indicated by the patient’s clinical condition

Ingestion
• maintain a clear airway and adequate ventilation
• give oxygen if indicated
• gastric lavage should not be undertaken due to the increased risk of aspiration
• monitor pulse, respiratory rate, oxygen saturation, conscious level and temperature
• perform a 12 lead ECG and monitor cardiac rhythm in symptomatic patients
• other supportive measures as indicated by the patient’s clinical condition

Clinical decontamination and first aid references
TOXBASE  http://www.toxbase.org (accessed 01/2016)
TOXBASE  Petrol, 05/2010
TOXBASE  Petroleum distillates – features and management, 04/2010
TOXBASE  Petroleum distillates – inhalation, 03/2010
TOXBASE  Petroleum distillates – skin contact, 03/2010
TOXBASE  Eye irritants, 04/2014
This document from the PHE Centre for Radiation, Chemical and Environmental Hazards reflects understanding and evaluation of the current scientific evidence as presented and referenced here.

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