

Occupational exposure to phosphine when handling fumigated containers

Phosphide-based products (aluminium, calcium, magnesium, zinc) are used as insecticides and rodenticides and are subject to the regulations on either biocidal products or plant protection products, depending on their use. In particular, they are used to treat places where food is stored, such as shipping containers. In the presence of moisture, phosphides release phosphine, an active substance that can cause irritating or corrosive effects, or even lead to severe systemic poisoning that is potentially fatal depending on the concentration.

.A previous report of the Toxicovigilance Coordinating Committee on cases of exposure to products containing phosphides covered the period 1999-2013¹.

As part of a joint project on this topic with the Brussels Poison Control Centre, the French data were updated, focusing on “accidents occurring in the context of port and maritime activities over the last 20 years”.

The aim of this new study was to describe cases of occupational exposure to accidental releases of phosphine or phosphide-based products. The incidents which occurred specifically in the context of port or maritime activities or during the unloading and opening of containers, were described in terms of circumstances, symptoms and severity, based on the dossiers recorded in the Poison Control Centres' information system between 1 January 1999 and 31 December 2017.

Nine dossiers met the criteria for inclusion in the study, providing 12 symptomatic cases related to phosphine exposure. All cases occurred from 2011 onwards, with no signifi-

cant geographical predominance; no cases were recorded before 2011. The average age of subjects was 35.7 years, and all were male. The most common route of exposure was respiratory, sometimes associated with skin or eye contact. All symptomatic cases were followed up by a medical consultation, mostly in an emergency department (9 out of the 12 cases). In all cases, low-intensity symptoms were observed, and the outcome was favourable. The symptoms described were mostly of an irritative type (respiratory, skin or eye), sometimes associated with other signs (headache, nausea, dizziness, asthenia, epigastric pain or discomfort).

This study thus shows that occupational exposure to phosphides or phosphine releases, although probably underestimated and poorly documented, has been a reality for several years for personnel working in contact with containers. A recent report published by EU-OSHA² (European Agency for Health and Safety at Work) mentions the presence of phosphine in a significant percentage of containers in European ports and notes the lack of labelling and appropriate safety rules.

As a conclusion to this retrospective study based on a series of cases, ANSES cites the recommendations of the EU-OSHA report, which advocates strengthening the regulation and control of labelling by the competent authorities, within a standardised European framework.

1. [Anses. \(2015\). Expositions à des préparations contenant des phosphures : Etude rétrospective des observations enregistrées par les Centres antipoison et de toxicovigilance français \(1999-2013\)](#)

2. EU-OSHA (2018). Health risks and prevention practices during handling of fumigated containers in ports <https://osha.europa.eu/en/tools-and-publications/publications/health-risks-and-prevention-practices-during-handling-fumigated/view>

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In order to prevent accidents, the report also recommends taking regular measures to raise awareness among dock workers (information on risks, interpretation of signs); these measures should be supplemented by the detection of fumigant gas residues when containers are opened, the degassing and forced ventilation of certain containers, and the use, if necessary, of personal respiratory protective equipment (in particular to remove solid phosphide residues before degassing, if phosphine concentrations remain above the thresholds, or in the context of customs inspections). In France, the INRS³ (French National Institute for Research and Safety) has published a fact sheet containing the main EU-OSHA recommendations and safety instructions to be followed when “unpacking” a container.

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TO FIND OUT MORE, READ THE:

[RAPPORT de l'Anses relatif aux Expositions à des préparations contenant des phosphures dans le cadre d'une activité portuaire ou maritime, ou lors de l'ouverture d'un conteneur - Etude rétrospective des observations enregistrées par les Centres antipoison et de toxicovigilance français \(1999-2017\) \(REPORT from ANSES on Exposure to products releasing phosphine during port or maritime activities or when opening a container - A retrospective study of the cases recorded by the French Poison Control and Toxicovigilance Centres \(1999-2017\)](#)

3. <http://www.inrs.fr/dms/inrs/CataloguePapier/ED/TI-ED-6194/ed6194.pdf>