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USING THE GHS FOR THE HAZARD CLASSIFICATION OF WASTES: A CRITICAL NOTE

Preamble

For the purpose of this note the term 'hazardous waste' is understood as defined in Article 1 of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. The term 'waste' is defined as: substances or objects/articles or a mixture thereof which are disposed of or are intended to be disposed of or are required to be disposed of by legal provision and do not fall under the definition of 'hazardous waste' as described above.

Waste categorisation should not be confused with waste classification. Waste categorisation is generally understood as a summing up of types of wastes based on: (i) composition (e.g., waste from the production of pharmaceuticals, waste mineral oils), (ii) origin (e.g., clinical waste from hospitals, garden waste, household waste) or (iii) on specific constituents in the waste (e.g., waste containing asbestos, waste containing organic solvents). Waste categorisation as defined in the Basel Convention is the most generally used system. Waste classification is a way to classify wastes in accordance with certain defined criteria such as hazard criteria (e.g., environmental, physiochemical, human health) or potential energy source criteria (e.g., biomass content, carbon components). For proper management of potential hazardous wastes, it is essential to have adequate information about the hazards linked to the waste and the subsequent human and environmental risks inflicted by exposure to the waste of concern.

Scientific basis of the GHS

The classification of chemicals and mixtures of chemicals was globally harmonised in 2003 in the GHS (Globally Harmonised System for the Classification and Labelling of Chemicals and Chemical Mixtures). The GHS is based on 2 main principles:

- It is essential to have adequate information about the characterisation of the chemical substance or mixture, including its stability;
- Classification is based on the intrinsic properties (the hazards) of the chemical substance or mixture concerned and does not address exposure to the chemical or mixture.

In addition, it is important to understand that there are no complete exemptions from the scope or application of the GHS as a whole for any particular type of chemical or mixture (product) or any specific use, although, at certain stages of the life cycle of the chemical or mixture, other hazard communication approaches than the labelling requirements included in the GHS may take precedent. For the latest edition of the GHS, see the UNECE website: http://live.unece.org/trans/danger/publi/ghs/implementation_e.html

Characterisation of the chemical substance or mixture.
In contrast to waste characterisation, chemical substance or mixture characterisation for the GHS includes: purity, possible presence of contaminants, composition (if a mixture), concentration of components and composition of the diluent or diluents, normal storage, transport and use conditions.

Hazard classification.
The GHS covers three types of hazards: the physic-chemical hazards (in the GHS referred to as physical hazards), human health hazards and environmental hazards. Hazards are generally assessed by laboratory and field testing in accordance with internationally agreed

testing protocols or by valid human evidence [well reported case(s) or epidemiological studies]. Such experimental results allow hazards to be classified based on severity.

The GHS is not a risk assessment instrument as the exposure to the hazardous condition is not considered in classification. For example, a very hazardous substance or mixture (e.g., a strong corrosive) may pose a very low risk of harm to people or property damage during transport (if the corrosive substance/mixture is securely contained in a non-leaking container). Similarly, a substance/mixture with an almost negligible health hazard (e.g. the substance sugar) may pose a very high risk of individual fatality if ingested in substantial quantities over a long period (life-threatening cardio-vascular diseases).

Although the GHS as such is not a risk assessment instrument, GHS hazard classification may be used as input into risk assessment processes where feasible. It should be noted, however, that hazard data sets for the risk assessment of several chemical product classes, most notably pharmaceuticals, food chemicals and pesticides, require substantially more data than provided by the GHS. Nonetheless, most human health hazards (both short and long term) and relevant physiochemical hazards are generally well covered by the system and, as such, may provide valuable input for chemical risk assessment and risk management considerations, as appropriate. However, environmental hazards covered by the GHS are largely assessed by extrapolation of results from a small number of tests in a few aquatic species only(fish, Daphnia and algae). In addition, long term environmental hazards are assessed only from algae (3-days), crustaceans (21-days) or fish (maximum 30-days). Furthermore the hazards related to chemical fate in the environment (biodegradation, bioaccumulation and persistence in the environment) are largely extrapolated from surrogate tests. Finally, specific hazards for terrestrial and sediment-dwelling species are not (yet) considered at all. Hence, the GHS does not provide an adequate tool for all environmental risk assessments.

The GHS as instrument for waste management

Whereas, as mentioned in the preamble, hazardous waste is defined in the Basel Convention as waste from a specific origin or containing specific chemical substances as listed in Annexes I and II of the Convention, waste in general is not defined with respect to what it contains: it is only defined as material to be disposed of. Consequently, for risk based waste management purposes, the Basel Convention only offers a rather rudimentary classification option: hazardous or not hazardous, without specification of the type of hazard or expression of the hazard as function of the concentration of the hazardous waste component(s).

There is a certain logic in the assumption that the GHS, being a far more sophisticated system to define a variety of hazards and hazard classes of chemicals and chemical mixtures, can be used for the risk management of wastes. However, taking into account the principles on which the GHS is based, application of the GHS to classify and label wastes is only possible when:

- The waste is sufficiently characterized, i.e., the composition of the waste considered for classification is known and well documented. With due care, exception may be made for inert and other components of the waste that are known to be non-hazardous;
- From the characterization of the waste there is sufficient evidence that components of the waste will not interact to form (a) new component(s) or cause (a) synergistic effect(s);
- The waste composition is stable and will not vary appreciably over time;
- The waste composition is homogeneous throughout the total volume of the waste considered; and

- Once characterized and documented, no other or similar wastes have been added to the characterized waste unless from documented characterization of the waste to be added it can be concluded that both wastes are substantially equivalent with respect to their composition.

Considering this, **it is generally not possible to use the GHS to assign a particular hazard classification to a waste**. Examples of particular wastes that may, as an exception to this, be classified in accordance with the GHS are likely to be at best limited to:

- well-defined and well monitored wastes from the normal production processes for certain industrial products (e.g., pharmaceutical and pesticide production)
- well characterized and GHS classified waste chemical substances or mixtures (e.g., waste mineral oils, solid or liquid pesticide waste, residual amounts of paint or cleaning compounds).

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