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Retrieval and scientific interpretation of ecotoxicological information

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Waste Classification According to the GHS

Waste management in South Africa is regulated under the National Environmental Management: Waste Act 2008 (Act 59 of 2008) ("Waste Act").

The National Waste Classification and Management Regulations stipulate that waste must be classified according to the Globally Harmonized System of classification and labelling of chemicals (GHS) as represented in South African National Standard SANS 10234:2008. The GHS is based on a broad description of hazard classes in the main categories of physical hazards, health hazards and hazards to the aquatic environment. Methods are provided for dealing with multi-component wastes.

The GHS provides references for approved test methods and criteria for classification of physical hazards. Classification of hazards to human health is based on total concentrations and hazardous properties of constituents. However, it may not in all cases be possible to classify materials by following the default classification in the GHS system. Examples of such cases are sand, soil, metallurgical slag, mineral ores and metal alloys, which can be described as "preparations". It should be recognised that these preparations have their own specific physical, chemical and toxicological/ecotoxicological properties distinct from those of their elemental constituents. In the majority of cases, there is a lack of toxicological information for the preparation. The primary issue is to assess the hazards associated with constituent metals and based on that, the hazards associated with the preparation.

This issue is addressed by determining the release of metal ions from preparations into artificial biological fluids. The results of these bio-elution tests are used by INFOTOX to assess the likelihood of toxic effects.

Thorough training and experience in health sciences is essential to interpret the results of the bio-elution tests with respect to the classification of the preparation into various health hazard categories. These are, amongst others, sensitising and irritating/corrosive effects of preparations, acute toxicity, reproductive toxicity[1], germ cell mutagenicity[2], carcinogenicity[3], and others.

[1] Interference with the ability to conceive spontaneously or to deliver healthy babies.

[2] Chemicals that cause mutations in the reproductive cells; i.e., sperm and ova, and that can be transmitted to the progeny (children).

[3] A cancer-causing substance.

Insofar as hazards to aquatic ecosystems are concerned, the GHS specifies a transformation/dissolution test to assess metals and metal compounds, based on acute and chronic aquatic toxicity of specified aquatic species. According to SANS 10234:2008, the combination of these species is considered as a reasonable surrogate for all aquatic organisms. Training and experience in environmental toxicology is essential to interpret the international aquatic toxicity database.

INFOTOX has extensive experience in the skillful classification of a diverse range of organic and inorganic materials, preparations and wastes, based on the above principles and according to the GHS as represented in SANS 10234:2008 Ed 1.1.