Comparison of Flammability and Oxidising Power of Gas Mixtures Using the ISO 10156 with Measured Flammability Data

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ABSTRACT

The Globally Harmonized System (GHS) of Classification and Labelling of Chemicals [1] is a worldwide initiative of the United Nations to promote standard criteria for classifying chemicals according to their health, physical and environmental hazards and to identify hazardous chemicals and to inform users about these hazards through standard symbols and phrases on the packaging labels and through safety data sheets (SDS). The new EU-GHS (CLP) Regulation [2] entered into force on 20 January 2009 in the European Union. The deadline for substance classification according to the new rules will be December 1, 2010 and for mixtures June 1, 2015. GHS defines 16 physical hazard classes and the Part 2 of GHS (issued by the United Nations) deals with the physical hazards:

Chapter 2.1 Explosives
Chapter 2.2 Flammable gases
Chapter 2.3 Flammable aerosols
Chapter 2.4 Oxidizing gases
Chapter 2.5 Gases under pressure
Chapter 2.6 Flammable liquids
Chapter 2.7 Flammable solids
Chapter 2.8 Self-reactive substances and mixtures
Chapter 2.9 Pyrophoric liquids
Chapter 2.10 Pyrophoric solids
Chapter 2.11 Self-heating substances and mixtures
Chapter 2.12 Substances and mixtures which, in contact with water, emit flammable gases
Chapter 2.13 Oxidizing liquids
Chapter 2.14 Oxidizing solids
Chapter 2.15 Organic peroxides
Chapter 2.16 Corrosive to metals

The classification of flammable and/or oxidizing gas mixtures based on either testing or calculation methods proposed by the revised international standard ISO 10156 [3]. This ISO standard is also used in the UN Recommendation on Transport Dangerous Goods [4]. These are the main reasons why a comparison of the results gained by using the calculation methods proposed in ISO 10156 with measured explosionflammability diagrams of CHEMSAFE [5] or other sources (e.g. experimental data for flammability of gas mixtures measured by Fuman Zhao in Mary Kay O’Connor Process Safety Center, TAMU, USA). This presentation discusses the new parameters in the revised ISO standard and the results of the comparison. The result influences the classification of mixtures and has also further consequences in the risk assessment.

REFERENCES

5. CHEMSAFE® – Database for Recommended Safety Characteristics, BAM, PTB, DECHEMA, Germany, Version 1.4.10, 2009