



## Safety Evaluation - Transport of Dangerous Goods - Guideline Requirement, Challenges, and Solution

Data requirement for any plant protection product includes information related to its explosibility. Different regulatory bodies need these data, as per either OCSPP (OPPTS) or EC test methods, performing thermal as well as mechanical (shock and friction) sensitivity tests. No single instrument or equipment can cover these aspects together. There is an absence of a certified equipment in the market for the determination of the mechanical sensitivity. Therefore, labs generally customise it or perform only thermal sensitivity test, leaving the mechanical sensitivity test untouched. Interpretation based on the thermal sensitivity test is not completely justifiable. Therefore, there is a need to develop an approach which, at least, defines the thermal sensitivity based on the experimental outcome, along with the theoretical interpretation of the mechanical sensitivity. We propose an approach based on the oxygen balance calculation and criteria for the thermal decomposition energy value ( $< 500 \text{ J/g}$ ).

### Explosibility

Current Testing Requirement	Combine Testing Proposal for Plant Protection Products
<p><b>OCSPP 830.6316</b></p> <p>01. Thermal explosibility</p> <p>02. Impact explosibility</p>	<p>01. Thermal sensitivity using DSC</p> <p><b>Outcome:</b> Exothermic decomposition energy is less than <math>500 \text{ J/g}</math></p>
<p><b>EC A.14</b></p> <p>01. Thermal sensitivity</p> <p>02. Mechanical sensitivity (shock)</p> <p>03. Mechanical sensitivity (friction)</p>	<p>02. When the substance contains chemical groups associated with explosive properties which include oxygen and the calculated oxygen balance is less than <math>-200</math></p> <p><b>Benefit:</b> Impact and Mechanical sensitivity tests can be excluded for plant protection products</p>



#### About The Author



#### **Hetal Desai**

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Specialised in the Analytical and Product Chemistry, she is a senior research officer at Jai Research Foundation. She is, actively involved in physico-chemical, method validation and stability studies. She has completed large number of studies for regulatory research and generating data for product safety for different regulatory submission. She has a professional experience of over 14 years in the CRO industry.

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