

# Case study: Copper and zinc speciation in gasification incinerator bottom ash (IBA) for an accurate waste classification

## The Need

WRc were commissioned by Viridor's Glasgow Recycling & Renewable Energy Centre to undertake a hazard assessment for waste classification of their gasification IBA.



Accurate hazardous property assessments of IBA often hinge on the understanding of the trace elements, copper and zinc.

Some, but not all, forms of copper and zinc are hazardous and so it is vitally important to understand what forms of these elements are present in IBA.

A correct classification is important to ensure that the material is managed safely and sustainably, but an incorrect classification could cost millions of pounds in unnecessary hazardous landfill fees.

## The Solution

As the concentrations of copper and zinc are usually too low for most analytical techniques to be useful, WRc developed a toolbox of complimentary techniques to provide the answer. These techniques included:

- thermodynamic modelling to predict the likely phases present;
- sequential chemical extractions and geochemical modelling to understand the leaching characteristics of the elements and what phases control them; and
- advanced material characterisation using highly specialised X-ray spectroscopy to quantify trace phases following a physical separation process to improve data resolution.

## The Outcome

This unique and ground-breaking approach to waste characterisation resulted in a thorough understanding of forms in which copper and zinc were present in the incinerator bottom ash.

They were found to be predominately present as stable compounds such as minerals and metals which have no hazards associated with them.

Consequently, the IBA was classified as non-hazardous enabling the sustainable use of the material as an aggregate for construction applications.

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*WRc provided a novel and cutting edge approach to classifying a challenging industrial waste*



independent | trusted | innovative

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