

Notes from the session: **Limitation of standard leaching procedure for assessment of redox sensitive element in waste.**

HvdS: Hans van der Sloot

CM: Christian Maurice

HvdS: Basic characterisation leaching tests as described in CEN TC 292 and ISO TC 190 standards do not take redox sensitive materials into account. pH stat is generally oxidised or intermediate (not reducing!). Percolation test can be reducing, but unless dissolved O₂ is avoided can show partial oxidised conditions.

CM: pH and redox usually interact together and should not be dissociated. How could the leaching of redox sensitive be assessed in a more appropriate way?

HvdS: Ensure that when you want to test a reducing material, that the equipment is either placed in a glovebox or otherwise measures are taken to avoid disturbance of results by O₂ from the atmosphere (in column use N₂ flushed leachant and have N₂ around outlet tubing and collection vessels)

CM: Possible atmosphere are CH₄+CO₂ (LFG, with risk for acidification), CH₄, N₂. Addition of methane enhance establishment of reduced condition in shorter time. N₂ may not be sufficient to establish reduced conditions, and there is always risk for O₂ intrusions.

CM: There are several steps in the standard leaching procedure which may lead oxidation of the sample i.e. sample preparation, crushing, filtration. Could we come with recommendations about what should be improved when one wants to assess redox sensitive elements? Fe, Mn, Dissolved O₂ and redox-electrodes could be used.

HvdS: In spite of the critical nature of Eh measurement, it is still a valuable measurement to highlight large differences in redox state.

HvdS: To assess reducing or oxidised conditions of materials a good practise is to either oxidise a reducing material or reduce an oxidised material prior to characterisation testing

CM: The material should be tested in the conditions that are relevant for its future use/destination. Authorities should be convinced that not only standard batch test should be used. What are the LIMITATIONS!?

HvdS: The scenario under consideration determines what condition in testing one should aim for. Recognising that conditions may change with time. Large scale landfills with reducing materials will produce reducing leachate for a very long time (even largely inorganic waste landfills as they are not without organic matter entirely). It is relevant to realise that an oxidation front may enter from the surface depending on the type of cover.

HvdS: Development of a redox capacity test (results expressed in mg or mmol O₂/kg dry matter) at European level would be useful to assess how long it takes for a material to become oxidised.

CM: Redox capacity tests would give a hint about future waste behaviour in different application e.g. landfill

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