

## The influence of electrodynamic remediation on dioxin (PCDD/PCDF) levels in fly ash and air pollution control residues - DTU Orbit (09/11/2017)

### The influence of electrodynamic remediation on dioxin (PCDD/PCDF) levels in fly ash and air pollution control residues

Fly ash and Air Pollution Control (APC) residues collected from three municipal solid waste incinerators in Denmark and Greenland were treated by electrodynamic remediation at pilot scale for 8-10 h. This work presents for the first time the effect of electrodynamic treatment on polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF), and how these levels impact on the valorization options for fly ash and APC residue. PCDD/PCDF levels in the original residues ranged between 4.85 and 197 ng g<sup>-1</sup>, being higher for the electrostatic precipitator fly ash. The toxic equivalent (TEQ) varied ten fold, ranging 0.18-2.0 ng g<sup>-1</sup> I-TEQ with penta and hexa-homologs being most significant for toxicity. After the electrodynamic treatment PCDD/PCDF levels increased in the residues (between 1.4 and 2.0 times). This does not mean PCDD/PCDF were synthesized, but also that soluble materials dissolve, leaving behind the non-water soluble compounds, such as PCDD/PCDF. According to the Basel Convention, PCDD/PCDF levels in these materials is low (<15 mg WHO-TEQ kg<sup>-1</sup>) and the fly ash and APC residue could eventually be valorized, for instance as construction material, provided end-of-waste criteria are set and that a risk assessment of individual options is carried out, including the end-of-life stage when the materials become waste again.

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Authors: Dias-Ferreira, C. (Ekstern), Kirkelund, G. M. (Intern), Jensen, P. E. (Intern)

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