Studying the melting behaviour of fly ash from the incineration of MSW using viscosity and heated stage XRD data

The purpose of the present study has been to investigate the melting behaviour of fly ashes from the incineration of MSW (municipal solid waste). Four fly ash samples from the Svendborg WtE (waste-to-energy) plant (2nd-3rd pass, super-heater, economizer, ESP), in Denmark, have been investigated, by use of a high-temperature rotational viscometer in order to determine the rheology of the ash material, and by a hot-stage XRD in order to identify phase changes and transformations during the heating and cooling of the ash samples. Knowledge of the ash melting properties as well as phase changes and transformations may lead to a more appropriate control of the plant, in order to minimize ash deposit build-up and corrosion of the heat transfer surfaces. The current data provide an accurate quantification of the melting and rheological properties of waste incineration ash and their use will be an effective tool to reduce deposition, and corrosion problems in waste incinerators as a function of operating temperature.

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