

MORPHOLOGY OF COAL ASH: CONSTRAINTS ON FLY ASH DISPERSION AND AIR POLLUTION

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Abstract

Bottom ash (BA), fly ash (FA) samples from two thermal power plants and pond ash samples from the Singrauli Power Plant area in India were collected and examined for their morphology using scanning electron microscopy (SEM). Plerospheres are the dominant structures both in fly ash and pond ash samples. The presence of plerospheres in pond ash confirms their stability under extreme conditions during transport of fly ash slurry through high pressure pipes from plant to the ash ponds. It is envisaged that plerospheric structures (encapsulation of small within large spheres, hence larger size and higher weight) would resist easy dispersal of fly ash particles and reduce environmental pollution. High intensity winds will be required to re-suspend and transport the ash particles dominated by plerospheres. Thus, morphology exercises a control on fly ash dispersal and related environmental pollution. Coal combustion processes favouring generation of plerospheres should be encouraged to reduce environmental pollution.

Keywords: Fly ash, plerospheres, morphological control, air pollution, India