

The Potential Utilization of Class F Fly ash: A Review

Manoj^{1,*}, Ayaz Ahmed² and Dilip Kumar Rajak³

¹*Metallurgical and Materials Engineering Department, NIT Srinagar J&K 190006*

²*Mechanical Engineering Department, NIT Srinagar J&K 190006*

³*Chemical Engineering Department, NIT Srinagar J&K 190006*

^{*}*E-mail: manojmohbe@gmail.com*

Abstract—Fly ash is an industrial waste produced from the coal-fired thermal power plant and hazard to the environment. Fly ash particles contain minerals with high melting points (such as silicon dioxide, aluminum oxide, and iron oxide) condense to form the fly ash spheres, after which, the substances with lower melting points condense on the surfaces. On the basis of chemical compositions fly ash is classified as Class C and Class F. The potential adverse effects of fly ash are: (i) leaching of potentially toxic substances from ash into soils and ground water, (ii) changes in plant elemental composition, (iii) increased cycling of these toxic elements through the food chain and (iv) respiratory problems to human beings. As a matter of fact the coal-fired thermal power plants (TPP) cannot generate electricity without creating environmental pollution in one form or another be it air, water or soil. In the aquatic environment fly ash ingredients leached out which affect the fertility of soil and fly ash is also contaminate ground water as well as surface water. Class F fly ash is converted into a polymer like material by reducing its size with functionalization and the functionalized fly ash is used as a gel strength maintainer and viscofier in drilling fluid for the extraction of crude oil in laboratory scale under American Petroleum Institute (API) norms. The objective of this paper is to review the potential utilization of Class F fly ash to cement industry, as an adsorbent of bisulphite by converting Class F fly ash to azol and lubricant in Pipe Jacking.

Keywords: Class F, Functionalization, Gel strength maintainer, Viscofier, API.