

# **Evaluation of Class 'C' and Class 'F' Fly Ash as Precursors for a Corrosion Resistant Geopolymer Coating**

**C. Montes and E.N. Allouche**

Trenchless Technology Center, Louisiana Tech University, Ruston, LA, 71272

KEYWORDS: fly ash, corrosion, geopolymer

## **ABSTRACT**

Concrete structures located in acidic environments (either manmade or naturally occurring) tend to exhibit accelerated deterioration. Common rehabilitation techniques for such structures include cementitious-based coatings. However, the durability of these products in harsh environments limits their useful design life. This poster describes the development and testing of two geopolymer mix designs made using fly ash (class C and F) precursors as part of a wider research initiative for developing a corrosion resistance geopolymer grout. The testing program was conducted in a laboratory setting under controlled conditions where specimens from these mix designs and specimens from a binary Portland cement-silica fume blend and a metakaolin-based geopolymer mix were placed in several concentrations of sulfuric acid (pH = 0.6, 1.0, 2.0 and 3.0). It was found that the corrosion resistance of geopolymer grout made from a class F fly ash precursor is nearly nine (9) times greater than that of OPC-Silica Fume binary blend. Fly ash geopolymer was also found to perform better than metakaolin geopolymer, especially because of the high liquid to powder ratio needed to achieve workability.