

AIP Conf. Proc. 1669, 020062 (2015); <http://dx.doi.org/10.1063/1.4919200>

Conference date: 10–12 December 2014

Location: Tronoh, Malaysia

Abstract

This research studied the effects of varied weight percentage and length of ceramic wool fiber (CWF) reinforcement to fire retardant performance of epoxy-based intumescent coating. Ten formulations were developed using ammonium polyphosphate (APP), expandable graphite (EG), melamine (MEL) and boric acid (BA). The mixing was conducted in two stages; powdered materials were grinded in Rocklabs mortar grinder and epoxy-mixed using Caframo mixer at low speed mixing. The samples were applied on mild steel substrate and exposed to 500°C heat inside Carbolite electric furnace. The char expansion and its physical properties were observed. Scanning electron microscopy (SEM) analyses were conducted to inspect the fiber dispersion, fiber condition and the cell structure of both coatings and chars produced. Thermogravimetric analyses (TGA) were conducted to study the thermal properties of the coating such as degradation temperature and residual weight. Fire retardant performance was determined by measuring backside temperature of substrate in 1-hour, 1000°C Bunsen burner test according to UL 1709 fire regime. The results showed that intumescent coating reinforced with CWF produced better fire resistance performance. When compared to unreinforced coating, formulation S6-15 significantly reduced steel temperature at approximately 34.7% to around 175°C. However, higher fiber weight percentage had slightly decreased fire retardant performance of the coating.

© 2015 AIP Publishing LLC

Key Topics

Ceramics

Natural fibers

Scanning electron
microscopyThermogravimetric
analysis

Acids

MOST READ THIS MONTH

On the dynamic strength of 304L stainless steel under impact

Meir Werdiger, Benny Glam, Lior Bakshi, Ella Moshe, Yossef Horovitz and Shlomi Levi Pistinner

Emerging trends in X-ray spectroscopic studies of plasma produced by intense laser beams

V. Arora, J. A. Chakera, P. A. Naik and P. D. Gupta

GISAXS study of Au-coated light-induced polymer gratings

M. Castro-Colin, D. Korolkov, N. S. Yadavalli, M. Mayorova, S. Santer and M. Kentzinger

MOST CITED THIS MONTH

Periodic table for topological insulators and superconductors

Alexei Kitaev

The FLUKA code: description and benchmarking

G. Battistoni, F. Cerutti, A. Fassò, A. Ferrari, S. Muraro, J. Ranft, S. Roesler and P. R. Sala

Analysis of positron profiling data by means of "VEPFIT"

A. van Veen, H. Schut, J. de Vries, R. A. Hakvoort and M. R. Ijpma