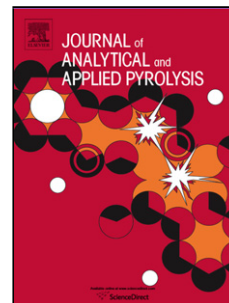


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# Effects of Nano-sized Boron Nitride on Thermal Decomposition and Water Resistance Behaviour of Epoxy-based Intumescent Coating

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## Highlights

- The influence of Nano-sized Boron Nitride on intumescent fire retardant formulation has been investigated. BN-4 showed the back side substrate temperature 140°C after the 1h fire test.
- BN-4 showed the char expansion 54.84% higher compared to the BN-1 and 44.49% residual mass was also recorded by the BN-4 coating.
- Pyrolysis GC-MS confirmed that formulations BN-4 released less gaseous product concentration compared to BN-1.
- There was no trend of mass gain with increasing amount of nano-sized BN into the coating in the water immersion.

## Abstract

In present research work, the effect of nano-sized boron nitride (BN) was studied on intumescent fire retardant coating (IFRC) for structural application. The coated steel substrates were subjected to furnace fire test at 800°C for 2h and fire protection test for 1h. The coatings were characterized by Thermogravimetric analysis (TGA) while the char from fire test was characterized by field emission scanning electron microscopy (FESEM), X-ray diffraction

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