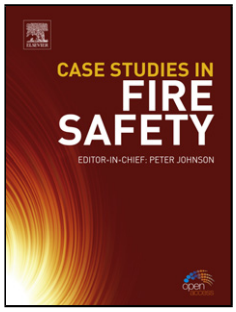

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Oxidation behavior of a double-layer iridium-aluminum intermetallic coating on iridium at the temperature of 1400°C to 2000°C in the air atmosphere

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Highlights

- The Ir–Al intermetallic coating exhibits an $IrAl_{2.7(3)}$/IrAl double-layer structure.
- The aluminizing treatment greatly improves the oxidation resistance of the pure Ir.
- Melting and oxidation process remarkably affects surface morphology of oxidized Ir-Al.

Abstract: Iridium (Ir) does not form a protective oxide barrier in high-temperature oxidizing environments, leading to a limited lifetime at high temperatures. To improve the oxidation resistance, pure Ir was modified by pack cementation to produce a double-layer iridium–aluminum (Ir–Al) coating. The oxidation behavior investigation on the Ir–Al coatings at temperatures from 1400°C to 2000°C demonstrated that the oxidation resistance of the Ir were significantly enhanced after the pack cementation treatment. Further detailed studies showed that the morphology and mass loss of