C25 CORROSION OF MILD STEEL IN COIR DUST ASH AND COIR DUST SOOT

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Corrosion of mild steel (Fe - 0.23 C - 0.35 Si - 0.89 Mn) in coconut coir dust ash (SiO_2, Al^{+3}, $Fe^{+2/+3}$, K^+, Na^+, CO_3^{-2}, Cl^-) and in coir dust soot (Carbon, Al^{+3}, $Fe^{+2/+3}$, K^+ Na^+, SO_4^{-2}, Cl^-) was studied at room temperature by weight loss and pit-depth measurements.

In coir dust ash, the corrosion proceeded linearly with time upto the 5th day and levelled off to around 10 mdd. Addition of water did not affect the corrosion appreciably. The corrosion was localised; pit depth did not increase with time. Probable mechanism is crevice corrosion.

In coir dust soot, weight loss vs. time curves were linear during the entire test period. The presence of added water increased the corrosion rate from 45 mdd to about 55 mdd. Initially the corrosion was fairly uniform over the steel surface but after three days very deep pitting was observed (pitting corrosion).

The different mechanisms found in ash and soot is due to the different Cl^- contents (Soot - 19.1% Cl^- and Ash - 1.3% Cl^- by weight). Chloride ion, particularly with Fe^{+3} causes pitting in steels. Although SO_4^{-2} is known to inhibit pitting in steels, it is not present in sufficient amounts in soot to suppress pitting.

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