

Abstract Submitted
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A New Method Based on RF Impedance Technology and Soft Ferromagnetic Ribbons for Real-Time Corrosion Monitoring¹ IZABELLA BERMAN, JAGANNATH DEVKOTA, HARIHARAN SRIKANTH, MAHN-HUONG PHAN, None — Development of a quick, cheap, and reliable technique to estimate the concentration of corrosive chemicals has been of technological interest for safety in industries and the environment for many years. Here we present a new approach for real-time monitoring of chemical corrosion based on the radio-frequency (RF) impedance technology and soft ferromagnetic ribbons. The impedance (Z), resistance (R), and reactance (X) of a commercial METGLAS®2714A ribbon was measured in real time for 5 μ l of drop-casted HNO₃ of various concentrations. Variations in the concentration of the drop-casted acid were assessed by considering the difference (Δ) in the Z , R , and X with and without the acid treatment. The measurements performed at 0.2 MHz showed a large linear increase in the ΔZ and ΔR with the acid concentration which is ideal for developing highly sensitive chemical sensors. Since the ribbon used is commercially available at low cost and the measurement system is quick and low power consuming, the proposed sensor can be used as an easy, quick, and low-cost chemical probe in industries and environmental safety purposes.

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