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Corrosion studies of magnesium, aluminum and zinc in citrate containing electrolytes

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Corrosion behavior of magnesium, aluminum and zinc in $0.2 \text{ mol dm}^{-3} \text{ NH}_4\text{Cl}$; $0.1 \text{ mol dm}^{-3} \text{ NH}_4\text{Cl}$ with addition of $0.1 \text{ mol dm}^{-3} \text{ Na-citrate}$ and corrosion behavior of zinc in $0.3 \text{ mol dm}^{-3} \text{ NH}_4\text{Cl}$ with addition of $0.8 \text{ mol dm}^{-3} \text{ Na-citrate}$ and different concentration of ZnCl_2 were investigated. Corrosion current densities were determined from the mass lost and from potentiodynamic (1 mV s^{-1}) measurements. It was concluded that magnesium and aluminum are not suitable anodic materials for use in primary electrochemical power sources. On the other hand, it was concluded that zinc could be considered as possible anodic material in both primary and secondary electrochemical power sources.

Key words: corrosion, citrate, electrochemical power sources.