

Thermal and electrochemical properties of morpholinium salts with bromide anion

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The thermal properties and electrochemical stabilities of N-ethyl-N-methylmorpholinium bromide ($[\text{Mor}_{1,2}][\text{Br}]$), N-butyl-N-methylmorpholinium bromide ($[\text{Mor}_{1,4}][\text{Br}]$), N-octyl-N-methylmorpholinium bromide ($[\text{Mor}_{1,8}][\text{Br}]$), N-dodecyl-N-methylmorpholinium bromide ($[\text{Mor}_{1,12}][\text{Br}]$), and N,N-dihydroxyethylmorpholinium bromide ($[\text{DHEMor}][\text{Br}]$) were investigated. All salts were decomposed below approximately 230.00°C and their melting points were above 100.00°C except $[\text{DHEMor}][\text{Br}]$, which melted at 75.17°C . $[\text{DHEMor}][\text{Br}]$ appeared to possess the most wide liquid-phase range between melting point and decomposing temperature. The electrochemical windows of salts ranged from 3.3V for $[\text{Mor}_{1,8}][\text{Br}]$ to 3.6V for $[\text{Mor}_{1,4}][\text{Br}]$ and thus did not show any noticeable variation with cations used for salt synthesis.