

Conductivities of Room Temperature Molten Salts Containing AlCl_3 , Measured by a Computerized Direct Current Method

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The conductivities of the binary room-temperature molten salt systems AlCl_3 -*N-n*-butylpyridinium chloride (BPC), AlCl_3 -1-ethyl-3-methylimidazolium chloride (EMIC) and AlCl_3 -benzyltriethylammonium chloride (BTEAC) have been measured at different temperatures and compositions by a d.c. four-probes method.

There is a maximum of the conductivity at 50 mol% AlCl_3 in the AlCl_3 -BPC and AlCl_3 -EMIC systems at 40 to 80 °C, their activation energies being relatively low (20.79 and 14.76 kJ/mol, respectively). As to the AlCl_3 -BTEAC system, there is an irregular change in the conductivity at 40–70 mol% AlCl_3 in the temperature range 50 to 80 °C. The conductivities of the three RTMS are in the order AlCl_3 -EMIC > AlCl_3 -BPC > AlCl_3 -BTEAC, the reason being discussed.

Key words: Conductivity; Room-temperature Molten Salts; Activation Energy; Direct Current Method; Computerized Measurement System.