

Materials of Conferences

EFFECT OF IONS ON THE ELECTRICAL CONDUCTIVITY OF ELECTROLYTE SOLUTIONS

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The article shows that the larger the size of the ions, the lower the electrostatic forces between

the cations anions, causing the decline of their association and the electrical conductivity of the solution.

Electrical conductivity - one of the most easily of measurable properties of the system, you can choose the optimum temperature and concentration process conditions. Dependences of electrical conductivity the nature of the ions is evident (Table 1).

Table 1.

Dependence of the electrical conductivity of the nature of the ions

anion kation	Cl ⁻	Br ⁻	NO ₃ ⁻	CO ₃ ²⁻	SO ₄ ²⁻	ClO ₄ ⁻	SiF ₆ ²⁻	P ₂ O ₇ ⁴⁻	PO ₄ ³⁻	OH ⁻
H ⁺	-	-	0,471	-	0,395	0,326	0,38	0,13	0,064	-
Li ⁺	-	0,0847	0,0896	-	0,0637	-	-	-	-	-
Na ⁺	0,1317	0,0865	0,0871	0,08	0,07136	-	-	-	-	0,31
K ⁺	0,128	0,0976	0,0874	0,105	0,0906	-	-	-	-	0,4
Rb ⁺	0,102		0,0654	0,0628	0,0652	-	-	-	-	0,32
Cs ⁺	0,071	0,0561	0,0515	0,0547	0,0492	-	-	-	-	-
Cu ²⁺	-	-	-	-	0,0921	-	-	-	-	-
Zn ²⁺	-	-	-	-	0,0636	-	-	-	-	-
Cd ²⁺	-	-	-	-	0,0504	-	-	-	-	-

Similar ranks can construct for other temperatures and concentrations. They are similar [1].

General patterns: in the concentration dependences of alkali halides maximum conductivity (at c^*) is shifted to high concentrations in the a number Na - K - Rb - Cs. The same is observed from carbonates and alkali metal nitrates. So, at LiCl $c^* = 20\%$, CsBr $c^* = 40\%$; K₂CO₃ at maximum corresponds to 40%, and Rb₂SO₃ and Cs₂SO₃ - 50%. At LiNO₃ $c^* = 30\%$, at Rb-

₂SO₄ and Cs₂SO₄, as that of Na₂WO₄ and Na₂MoO₄ - no of maximum. At Na₂CrO₄ $c^* = 33\%$, a maximum of specific electrical conductivity H₄P₂O₇ at 21%, and 60% at K₄P₂O₇.

Thus, the larger the size ion the lower the electrostatic forces between the anions, cations, causing their association and downturn of the electrical conductivity of the solution. Different effects of anions on the electrical conductivity depend on the number of oxygen atoms in them (Fig. 1).

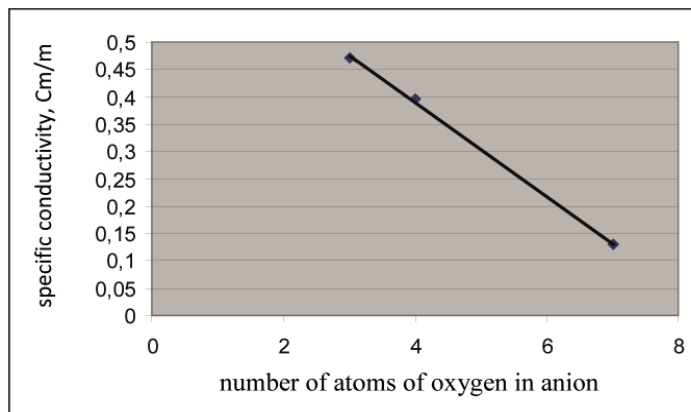


Fig. 1. the dependence of specific conductivity on the number of oxygen atoms in the anion

The more oxygen atoms, the less specific electrical conductivity, which is obviously associated with the formation of additional oxygen-hydrogen bonds. Can not but influence and the charge of the ion. But only spectral studies of systems can fully illuminate the influence of ions on the structure and the properties of solutions.

References

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