Debye-Falkenhagen effect :-

If an alternating current of very high frequency is passed through the electrolyte, the mutual displacement of an ion and its ionic atmosphere would be negligibly small. The ionic atmosphere would remain undisturbed → so the symmetry effect would vanish, especially when the period of oscillation is much less than the time of relaxation of the ionic atmosphere.

The relaxation time θ is the time in which the ionic atm. vanishes after removal of the central ion and its formation around an ion at a new point.

It is shown that, θ is of the order 10^{-10} / c sec. For a sol: When $C = 1 \times 10^{-3}$ N, application of a current of frequency 3×10^{8} would make noticeable increase of the conductance. This has been confirmed experimentally. This is called Debye-Falkenhagen effect ✗✗

Wien Effect :-

The velocity of an ion is proportional to the applied field, whereas the rate of formation of the ionic atm. is a finite quantity. Wien applied gradually increasing high voltage so that the ions would move with high speed. The ionic atm. had no longer the time to form itself. Under these conditions, it may be supposed that the ions leave their ionic atm. and move freely without them. The retarding effects — the relaxation effect and the electrophoratic effect would disappear.

By increasing the field strength to 20000 volts/cm, it was observed that the equivalent conductance is increase to the limiting value λ_0.

This is known as Wien effect.

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