

3.091 Solid State Chemistry: Week 7

Logan Pachulski

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Progress Update

Over the past week I have learnt about:

- 1 Orders of reactions.
- 2 Electrical properties of metals.

Reaction order

Integer reaction orders are easy to understand:

- 1 First order - reaction rate is linearly related to the concentration of the reactant.
- 2 Second order - reaction rate is dependent on the square of the concentration.

A first order reaction of the form



follows the equation

$$R = -\frac{dC_A}{dt} = kC_A, \quad (2)$$

while a second order reaction follows

$$R = kC_A^2 \quad (3)$$

Electrical properties of metals

Metals and all materials have inherent conductivity and resistivity. The resistance R of a sample with cross-sectional area A and length L follows the equation

$$R = \frac{L}{A} P_e \quad (4)$$

where P_e is the resistivity of the metal.