Defining Chemistry and Equilibrium

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Studying the Transformation of matter (Reaction):

$\longrightarrow$ **through time**: chemical kinetics

$\longrightarrow$ **through space**: chemical engineering

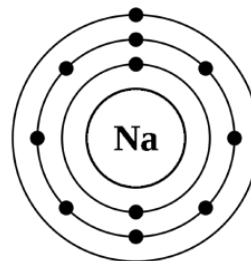Using a catalyst to increase the rate of a chemical reaction:

$$A + B \longrightarrow D \quad slow \tag{1}$$

$$A + B + \boxed{C} \longrightarrow E \quad fast \tag{2}$$

$$E \longrightarrow D + \boxed{C} \quad fast \tag{3}$$

A chemical reaction happens between atoms.

Chemistry is the preservation of the atom $\neq$ nuclear physics

$$H_2SO_4 + 2\,NaCl \longrightarrow Na_2SO_4 + 2\,HCl$$
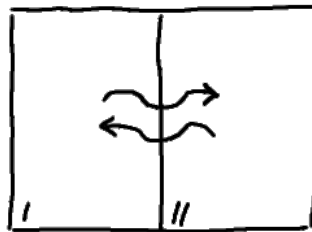
(a)   (b)

Figure 1: (a) The goal of osmosis is equilibrium (b) Rutherford's model

I : high concentration solution

II : low concentration solution

the placement of electrons in layers: $2 - 8 - 18 - 32$

The lowest point of energy consumption within a system is the state of physical equilibrium. Minimas are equilibrium points: The sum of vectorial forces is equal to 0. The state of optimization of system is the abscence of fluctuation over time of certain parameters.
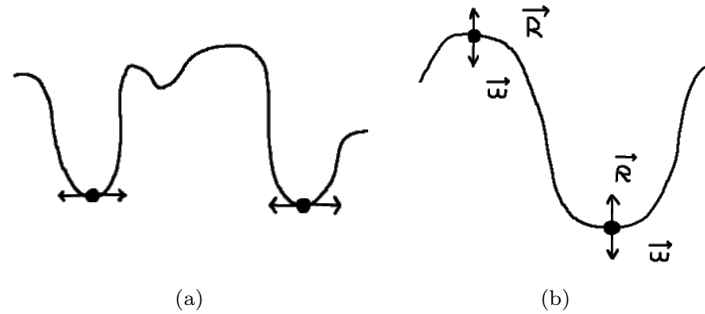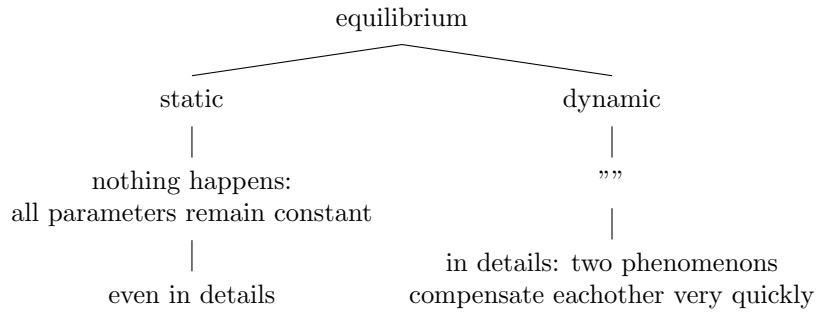

(a)   (b)

Figure 2: (A) ROLLERCOASTERS (B) THE MINIMA IS THE STABLE EQUILIBRIUM POINT

An example of dynamic equilibrium: marriage and divorce statistics in a city. The scale of the study influences the perception of it results.