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Subject.   :- Physical Chemistry

Title   :- Cohesive and Adhesive Force

Abstract :-

In this research I have given Formula of Cohesive and Adhesive force.

Introduction   :-

There are a number of phenomena that explains various things which we observe in our everyday life. Although, we sometimes miss to focus onto these little things, and these help us to keep life going on earth. Adhesion and cohesion forces are one of the two phenomena. Though they sound to be similar, still they are known to occur completely as different terms.

Surface tension is one of the essential properties of water that describes the relationship between the adhesion and cohesion. The tendency of two or more different molecules to bond with each other is known as Adhesion, whereas the force of attraction between the same molecules is known as Cohesion.

The adhesion and cohesion forces, both vary in their strengths. For example, if cohesion forces between the water molecules is strong than that of the adhesion forces between them, then the individual molecules will attract towards each other thus resulting to settling. In case, the adhesion forces of the water surfaces are strong than the that of the cohesion forces of the water molecules, then the water tends to disperse.

Research Methodology (Process) And Diagram :-

Cohesive force
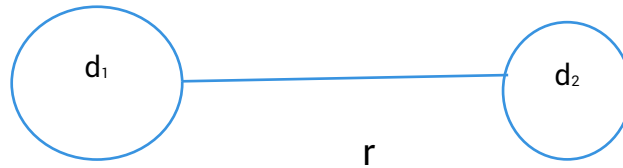
We know that, When only one substance is attracted to a molecule than that act or that attraction force know as Cohesive force.[1]

When a substance is attracted towards two molecules than the cohesive force work proportionally to their density of both molecules. If density of both molecules are d_1 or d_2 respectively than

$$F_{co} \propto d_1 d_2 \qquad \ldots\ldots\ldots\ldots\ldots (1)$$

It is inversely proportional to distance of both molecules. I.e.

$$F_{co} \propto 1/r \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (r \leq 10^{-9} m). \ldots\ldots (2)$$

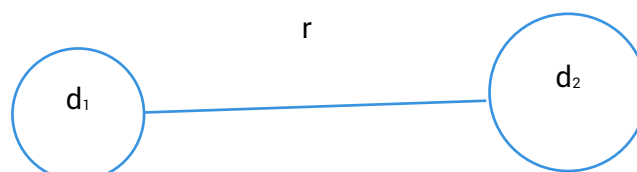From (1) and (2)

$$F_{co} \propto d_1 d_2 / r$$

$$F_{co} = k_{co} d_1 d_2 / r$$

Where k_{co} is constant which is know as cohesive attraction coefficient. Its value is the same between the molecules of the same substance. It depends on the density of those molecules, the distance between them and their temperature.

$$k_{co} = n*10^{-9}$$

This is equation of k_{co}. Where n is number which depends upon k_{co}.

Adhesive force

We know that, When different substances is attracted to a molecules than that act or that attraction force know as Adhesive force.[1]

When a substance is attracted towards two molecules than the Adhesive force work proportionally to their mass of both molecules. If masses of both molecules are d_1 or d_2 respectively than

$$F_{AD} \propto d_1 d_2 \qquad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

It is inversely proportional to distance of both molecules. I.e.

$$F_{AD} \propto 1/r \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (r \leq 10^{-9} m). \quad \ldots\ldots\ldots(2)$$

From (1) and (2)

$$F_{AD} \propto d_1 d_2 / r$$

$$F_{AD} = k_{AD} d_1 d_2 / r$$

Where k_{AD} is constant which is know as Adhesive attraction coefficient. Its value is the different between the molecules of the different substances. It depends on the density of those molecules, the distance between them and their temperature.

$$k_{AD} = n*10^{-9}$$

This is equation of k_{AD}. Where n is number which depends upon k_{AD}.

Conclusion:-

1. In this research I have given Formula of Cohesive and Adhesive force.

2. We can count Adhesive and Cohesive force from this formulas

References:-

1.[1]This line or sentences has taken from book of physics of Mittal Publishing. Its is author by Kumar Mittal.