



# Bioremediation of Heavy Metal Contaminated Aqueous Solutions Using Zoogloea Layer, Moss and Mushroom Cells

## Abstract

Abstract: This study aims to investigate the bioaccumulation of heavy metals in various organisms. The results show that the bioaccumulation of heavy metals is significantly higher in organisms with higher surface area to volume ratio. The study also shows that the bioaccumulation of heavy metals is significantly higher in organisms with higher surface area to volume ratio.

### Materials and Methods

The study was conducted in a laboratory setting. The organisms used were *Zooplankton*, *Moss*, and *Mushroom*. The heavy metals used were  $Co^{2+}$ ,  $Cd^{2+}$ ,  $Pb^{2+}$ , and  $Zn^{2+}$ . The bioaccumulation of heavy metals was measured using Atomic Absorption Spectrometry (AAS).

### Bioaccumulation experiment

The bioaccumulation experiment was conducted in a laboratory setting. The organisms used were *Zooplankton*, *Moss*, and *Mushroom*. The heavy metals used were  $Co^{2+}$ ,  $Cd^{2+}$ ,  $Pb^{2+}$ , and  $Zn^{2+}$ . The bioaccumulation of heavy metals was measured using Atomic Absorption Spectrometry (AAS).

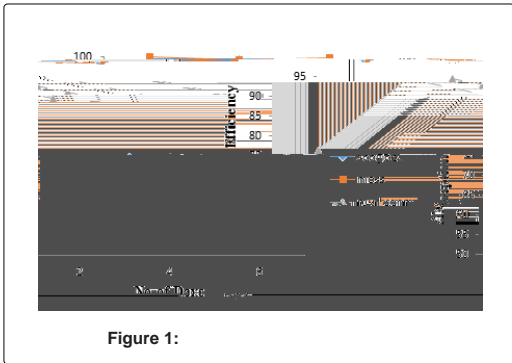


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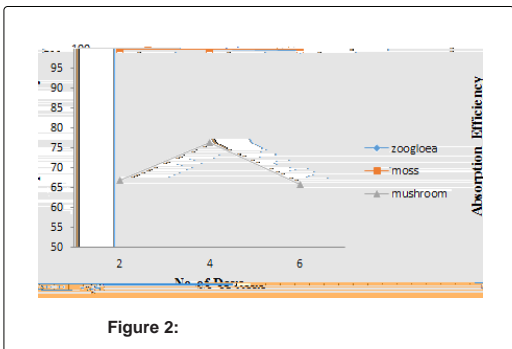


Figure 2:

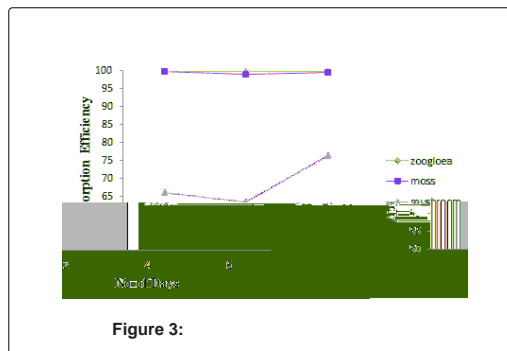


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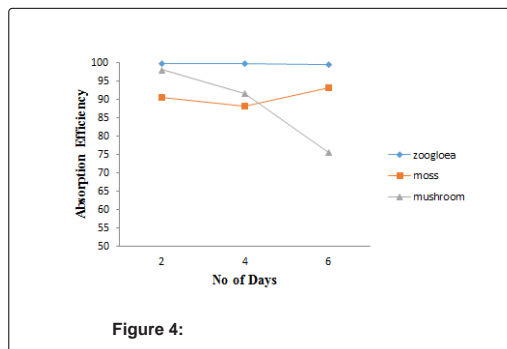


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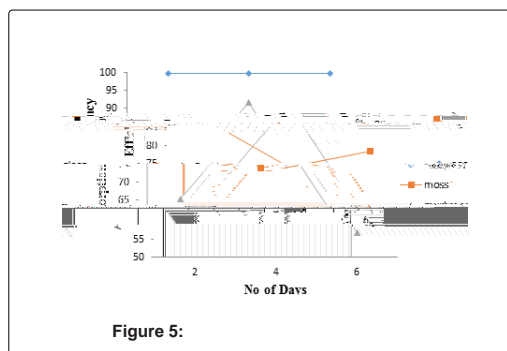


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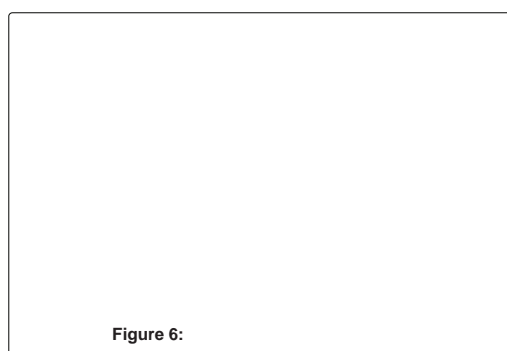


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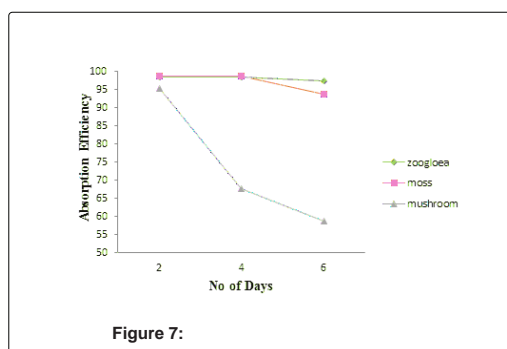


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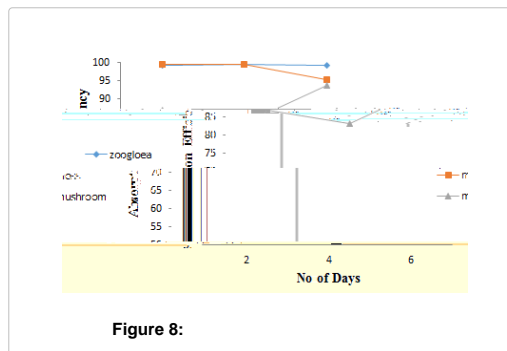


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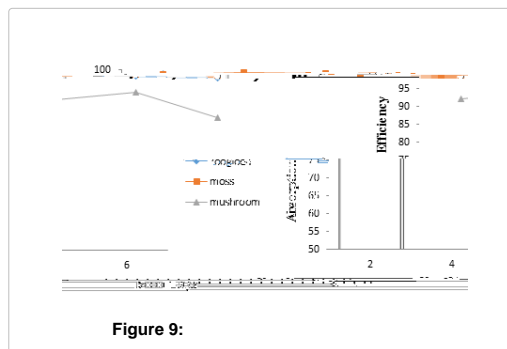


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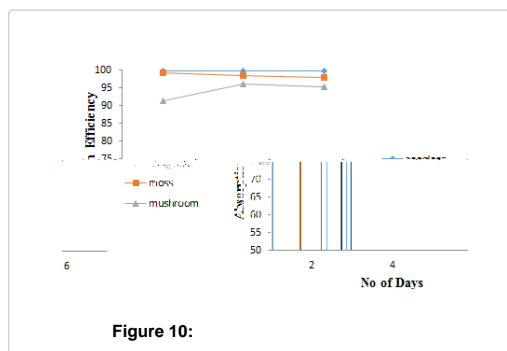


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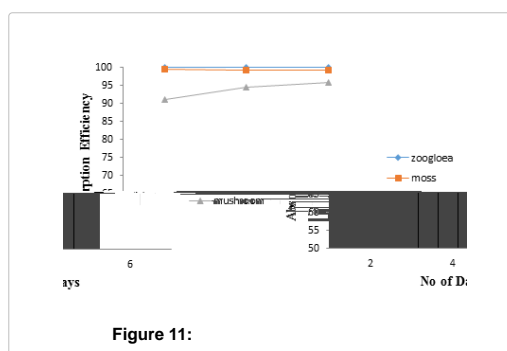


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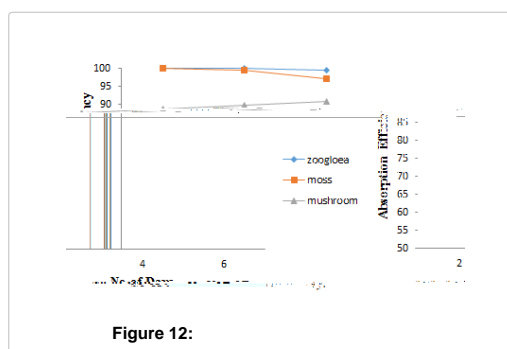


Figure 12:

## Conclusion

1. The study of the effect of the concentration of the solution on the rate of the reaction is one of the most important factors in the study of chemical reactions. The rate of the reaction is directly proportional to the concentration of the reactants. This is because the higher the concentration of the reactants, the more collisions between the molecules occur, and the more likely it is that a reaction will occur. This is known as the collision theory. The rate of the reaction is also affected by the temperature of the reaction. The higher the temperature, the more energy the molecules have, and the more likely it is that they will have enough energy to overcome the activation energy barrier and undergo a reaction. This is known as the Arrhenius equation. The rate of the reaction is also affected by the presence of a catalyst. A catalyst is a substance that speeds up a reaction without being consumed in the process. It does this by providing an alternative reaction pathway with a lower activation energy barrier. This is known as the transition state theory. The rate of the reaction is also affected by the surface area of the reactants. The larger the surface area, the more collisions between the molecules occur, and the more likely it is that a reaction will occur. This is known as the surface area effect. The rate of the reaction is also affected by the pressure of the reaction. The higher the pressure, the more molecules are packed together, and the more likely it is that they will collide and undergo a reaction. This is known as the pressure effect. The rate of the reaction is also affected by the volume of the reaction mixture. The smaller the volume, the more molecules are packed together, and the more likely it is that they will collide and undergo a reaction. This is known as the volume effect. The rate of the reaction is also affected by the concentration of the products. The higher the concentration of the products, the more likely it is that the reaction will reach equilibrium, and the rate of the reaction will decrease. This is known as the equilibrium effect. The rate of the reaction is also affected by the concentration of the reactants. The higher the concentration of the reactants, the more likely it is that the reaction will reach equilibrium, and the rate of the reaction will increase. This is known as the equilibrium effect. The rate of the reaction is also affected by the concentration of the products. The higher the concentration of the products, the more likely it is that the reaction will reach equilibrium, and the rate of the reaction will decrease. This is known as the equilibrium effect. The rate of the reaction is also affected by the concentration of the reactants. The higher the concentration of the reactants, the more likely it is that the reaction will reach equilibrium, and the rate of the reaction will increase. This is known as the equilibrium effect. The rate of the reaction is also affected by the concentration of the products. The higher the concentration of the products, the more likely it is that the reaction will reach equilibrium, and the rate of the reaction will decrease. This is known as the equilibrium effect.

## References