

Statistical optimization of hexavalent molybdenum reduction by *Serratia* sp. strain MIE2 using Central Composite Design (CCD)

ABSTRACT

The conversion of hexavalent molybdenum (Mo (VI)) to Mo-blue is a bioremediation technique which reduces the toxicity of molybdenum to a less toxic form by bacteria. The aim of this study is to determine the optimum conditions of significant parameters or variables that affect the reduction of Mo (VI) to Mo-blue by the local isolate identified as *Serratia* sp. strain MIE2. Response Surface Methodology (RSM) was used in this study to optimize the reduction process using Central Composite Design (CCD) as an optimization matrix. The optimum conditions predicted by RSM using the desirability function for the reduction process were 20 mM molybdate concentration, 3.95 mM phosphate, 6.25 pH and 25 g/L glucose and Mo-blue production occurred at the absorbance value of 20.5 at 865 nm. The validation of the predicted optimum points showed the Mo-blue production occurred at the absorbance value of 21.85 with a deviation around 6.6 % from the RSM predicted value.

Keyword: Bioremediation; Molybdenum; Agriculture soil; Isolation; RSM

