

## ISOLATION OF SULFUR OXIDATION BACTERIA AND DETERMINING OF MINIMUM INHIBITORY CONCENTRATION (MIC)

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### Introduction

The anthropogenic sources of metal contamination can be divided into five main groups: metalliferous mining and smelting, industry, atmospheric deposition, agriculture, and waste disposal. Conventional methods for the removal of the heavy metals ions from environment need high energy and cost. (1) Therefore, much attention has been paid to the removal of metal ions by microorganisms due to its potential applications in environmental protection, and recovery of toxic or strategic heavy metals. However, there have been suggesting and testing new methods for remediation of polluted environment based on the organisms. Bioremediation is one of the newest methods for decreasing heavy metals which causes acidification and the solubilization of metals based on the activity of the chemolithoautotrophic bacteria (mainly Thiobacillus ferrooxidans and Thiobacillus thiooxidans) is one of the promising methods for removing heavy metals from contaminated soils and sediment.(3)

In contrast, the advantages of bioremediation (e.g. bioremediation) are its relatively low cost, the mild conditions of the process and the subsequent low demand for energy or landfill space compared with conventional technologies.(2)

Thus, according to the cases mentioned above the potential of bacteria to remove heavy metals, providing optimum conditions for their growth is essential to select the appropriate Thiobacilli.

So investigate the isolating populations and their use in bioremediation is very important that research in this area has led to a major incentive.

Key Words: Thiobacilli, Zinc, Copper, MIC

### Material and method:

#### Sampling

To isolation and identification of the bacteria, soil sample was taken from an industrial area in Isfahan. The soil pH is slightly alkaline and rich in sulfur.

#### Growth of the Bacteria

Serial dilution method was used for bacteria isolation based on solid and liquid specialized culture. To prevent the growth of fungi and yeast benomyl and nystatin were used. They were incubated in 30°C and 140rpm. This bacteria dose not growth in nutrient agar medium. The minimum inhibitory concentration (MIC) of Cu and Zn which no colony growth occurred was determined by the agar dilution method with different concentration s of Cu and Zn (0.5-256 mM).

### Discussion:

Bacteria was isolated and purified from using specific mediums. Sulfur is an energy source. Growth appears in 10-15days in the form of minute straw yellow to cream-colored colonies. Biochemical tests were done for bacteria. It's gram negative, motility, aerobic, aototrophic and sulfur oxidizer that grow in low pH. Under the microscope, each colony is surrounded with crystals of Gypsum due to the action of the sulfuric acid, formed from the oxidation of the thiosulfate, upon the CaCl<sub>2</sub>. Create turbidity and reduce the pH of the environment is a sign of bacterial growth. MIC was determined for Cu and Zn, 256mMol/L. This bacteria can be tolerate heavy metals contamination. Therefore, the identification and isolation of these bacteria is important for reducing heavy of metal pollution in the environment. This bacteria was used for bioremediation that was shown good result for reducing heavy metals pollution.

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