

# Chemical Engineering

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## Create the isotherm condition in catalytic converters of sulfuric acid plants by heat pipe

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In the study, for the first time, we have tried to construct a pilot reactor, for surveying the possibility of creating isothermal condition in the catalytic converters where  $\text{SO}_2$  is converted to  $\text{SO}_3$  in the sulfuric acid plants by heat pipe. The thermodynamic and thermo-kinetic conditions were considered the same as the sulfuric acid plants converters. Also, influence of  $\text{SO}_2$  gas flow rate on isothermal condition, has been studied. A thermo-siphon type heat pipe contains sulfur and 5% iodine as working fluid, was used for disposing the heat of reaction from catalytic bed. Our results showed that due to very high energy-efficiency, isothermal and passive heat transfer mechanism of heat pipe, it is possible to reach more than 95% conversion in one isothermal catalytic bed. As the results, heat pipe can be used as a certain piece of equipment to create isothermal condition in catalytic converters of sulfuric acid plants and it can create the good potential to create a major evolution in the design of sulfuric acid plants.

### Biography

Mahdi Yousefi has completed his Master's degree from Tarbiat Modares University, Iran. He is the Director of Petro Rahbar Co., an engineering and consulting company which supplies know-how, engineering services for chemical plants.

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