

Zeolite Heat Exchanger

Ahmed, Yusra (School: Pak Turk Maarif International Schools and Colleges)

The purpose of the project was to construct an eco-friendly and cost effective alternative for heat exchanger by using naturally occurring Zeolite, which can store heat for an indefinite time by exploiting the heat adsorption properties of Zeolite. It can make use of waste heat or any other naturally occurring heat source, which can help reduce global warming. The engineering goals led to two processes; making of a prototype model of Zeolite Heat Exchanger, and measuring of the specific heat of Zeolite. The constructed heat exchanger was charged with heat and that heat was discharged by passing water through it. For charging, Zeolite gravels were heated with the help 1800 W electric heat blower for 5, 10 & 15 minutes. The initial temperature of zeolite gravels was 24°C, and the final temperature was 80°C, heat was released when water was passed through it which increased the temperature of water. After the cooling process when the zeolite gravels were immersed in the water container, the temperature of water rose from 26°C, to 34°C. Proving that Zeolite granules stored heat energy supplied by the flue gases in their molecular cages and released when water was passed through. In future, an industrial model of zeolite exchanger can be made which can be used for several purposes such as process fluid heating, domestic and industrial water heating and for producing electricity.