

## عنوان مقاله:

Mathematical Model for Turbulent Convective Heat Transfer and Friction Factor of Magnetic Nanofluid (Fe<sub>3</sub>O<sub>4</sub>/Water Nanofluid) in a Circular Tube

## محل انتشار:

اولین طرح تعاملی صنعت با دانشگاه: همایش سالانه پژوهش های کاربردی در علوم مهندسی و پایه (سال: 1393)

تعداد صفحات اصل مقاله: 7

## نویسندگان:

Esmail Jafari - *Department of Petroleum Engineering, Omidiyeh Branch, Islamic Azad University, Omidiyeh, Iran*

Ghazaleh Shakeri - *Department of Petroleum Engineering, Omidiyeh Branch, Islamic Azad University, Omidiyeh, Iran*

## خلاصه مقاله:

Heat transfer fluids such as water, oil and ethylene glycol play an important role in many industrial sectors, including power generation, chemical production, air-conditioning, transportation and microelectronics. The performance of these conventional heat transfer fluids is often limited by their low thermal conductivities. According to industrial needs of process intensification and device miniaturization, development of high performance heat transfer fluids has been a subject of numerous investigations in the past few decades. Nanofluids are a new class of heat transfer fluids consisting of nanometer sized particles (less than 100 nm) dispersed in convectional fluids. The nanofluid used in this research was a stable colloidal suspension of magnetic (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles having average diameter 32 nm. The convective heat transfer coefficient and friction factor characteristics of Fe<sub>3</sub>O<sub>4</sub> nanofluid for flow in a horizontal circular tube was evaluated mathematically in the range of  $3000 < Re < 22000$  and the nanoparticles volume concentration range of  $0 < \phi < 0.6\%$ . The results of this study showed that the Nusselt number increased with increasing the Reynolds number and volume concentration of nanoparticles and the friction factor increased with decreasing the Reynolds number.

## کلمات کلیدی:

Convective heat transfer, Friction factor, Magnetic nanofluid, Reynolds number

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/412154>

