

عنوان مقاله:

Effect aluminum oxide nanofluid on the heat transfer of shell and tube heat exchanger

محل انتشار:

دومین کنگره بین المللی علوم، مهندسی و فن آوری های نو (سال: 1403)

تعداد صفحات اصل مقاله: 17

نویسندگان:

Saeid Majdnia - Master's student in Mechanical Engineering, Islamic Azad University, Bushehr Branch, Iran

Mehdi Nakisa - Assistant Professor of Mechanical Engineering, Islamic Azad University, Bushehr Branch, Iran

خلاصه مقاله:

In this research, a numerical study of the effect of the use of water-aluminum oxide nanofluid on the heat transfer rate and pressure drop of the shell and tube heat exchanger has been done. For this purpose, computational fluid dynamics method and AnsysFluent commercial software have been used. The effect of Reynolds number and the volume fraction of nanoparticles in the base fluid on the increase in heat transfer, increase in pressure drop and the efficiency of the heat exchanger have been studied. The results show that the addition of nanofluid to the base fluid can significantly improve the heat transfer rate and heat exchanger efficiency. Also, the results show that as the Reynolds number increases and the flow becomes more turbulent, the amount of heat transfer also increases. The results show that if the goal is to use a flow with a Reynolds number of 6000 , the use of nanofluid with a volume fraction of 1% and 2% is more optimal. For flow with Reynolds number of 7500 , the use of nanofluid with a volume fraction of 3% is optimal. There is no justification for using nano fluid with a volume fraction of 4% . The results show that the best calculated efficiency factor is equal to 1.89 , which is obtained for a Reynolds number of 7500 and a volume fraction of 3% . The lowest PEC coefficients are generally related to pure water fluid

کلمات کلیدی:

nano fluid, heat transfer, shell and tube heat exchanger, aluminum oxide nanoparticle

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/2049613>

