

## عنوان مقاله:

Applications of Nano-fluid Heat Transfer Enhancement for Nuclear Reactor

## محل انتشار:

اولین کنفرانس انتقال حرارت و جرم ایران (سال: 1391)

تعداد صفحات اصل مقاله: 5

## نویسندگان:

Hamidreza Moradi - M.Sc. Student of Mechanical Engineering Department, School of Engineering, Shiraz University

Khosrow Jafarpur - Associate Professor of Mechanical Engineering Department, School of Engineering, Shiraz University

Kamal Hadad - Professor of Nuclear Engineering Department, School of Engineering, Shiraz University

## خلاصه مقاله:

Colloidal dispersions of nano-particles are known as 'nano-fluids'. Such engineered fluids provide the potential for enhancing heat transfer, especially boiling heat transfer, while avoiding such problems like erosion, settling, clogging that hindered the use of particle-laden fluids in the past, with the aim of assessing their benefits for and applicability to nuclear power systems particularly primary coolant, safety systems and severe accident mitigation strategies. Increasing the power produced per unit volume of the reactor core of operating and future Light Water Reactors (LWRs) is an effective approach to improve their economic attractiveness. Nucleate boiling is a very effective heat transfer mechanism. However, it is well known that there exists a critical value of the heat flux at which nucleate boiling transitions to film boiling, a very poor heat transfer mechanism may occur. In most practical applications it is imperative to maintain the operating heat flux below such critical value, which is called the critical heat flux (CHF). Obviously, a high value of the CHF is desirable, because, everything else being the same, the allowable power density that can be handled by a cooling system based on nucleate boiling is roughly proportional to the CHF. Depositing of nano-particles has a direct consequence of nano-boiling that enhances surface wettability so affected nucleation site density. In this article, nano-fluid's boiling phenomenon has been modeled and the obtained relatives are compared with the available experimental data, moreover, theories of boiling have been studied.

## کلمات کلیدی:

Pool boiling, Nano-fluid boiling, Wettability

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/170736>

