

Heat Transfer Characteristics in Micro Heat Exchangers

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In recent years technical development of micro fabrication focuses on application in the field of chemistry, chemical engineering and biochemistry. Especially, the high heat and mass transfer rates possible in micro reactors allow reactions to be performed under more aggressive conditions with higher yields than can be achieved with conventional reactors. In the present work, we studied heat transfer characteristics in two micro heat exchangers which were fabricated by stacking and by brazing micro channelled stainless steel plates. Micro channels were created by photolithograph and chemical etching. Nickel foils were inserted between micro channelled plates for vacuum brazing. Heat transfer characteristics in micro heat exchangers were test by using hot water (363K) and cold water (293K). It was observed that heat transfer rate of micro heat exchanger was 8.5 kW at the same flow of 600 kg/h. The heat transfer rate in micro heat exchangers was linearly increased with the velocity of water. The gap of heat transfer rate in two micro heat exchangers at same flow rate was observed due to the difference of heat transfer area.