

Experimental investigations were conducted to examine the influence of surface enhancement on crystallization fouling in a double pipe heat exchanger operating under forced convective heat transfer. Moreover, it substantially reduced fouling resistance. Sodium sulfate at its saturation concentration was utilized, leading to precipitation on the outer surface of the tube due to counter-current flow of the hot fluid. Notably, installing the coiled wire insert on the outer surface of the inner tube was more effective in reducing fouling resistance compared to installing it on the inside surface. The study focused on evaluating the impact of surface enhancement on heat transfer coefficient and fouling resistance for both smooth and enhanced surfaces. The experiments involved using a hot fluid (salt solution) at 40°C and Reynolds number ranging from 5300 to 20,000, while a cold fluid (distilled water) at 10°C with Reynolds number ranging from 13,000 to 22,000 was circulated through the inner tube. Surface enhancement was achieved by incorporating a coiled wire insert either inside or outside the inner tube.