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EFFECT OF ELECTROLESS NI-P BASED COMPOSITE COATINGS WITH DIFFERENT SURFACE FREE ENERGIES ON CLEANING TIME OF TOMATO FOULING DEPOSIT.

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ABSTRACT

Fouling build-up can be influenced by the interface activity between the inner surfaces of process equipment and the process fluid. Surface free energy is one of the factors that influence the interactions between the interfaces. High surface free energy may promote a lot of foulant particles to attach onto the equipment surfaces. So many works have been done to investigate the effect of surface free energy on fouling build-up, but a few work have been done to investigate the effect of surface free energy on cleaning time. In this work, effect of surface free energy on cleaning time of tomato fouling deposit was studied. Seven stainless steel disks were coated with Ni-P and Ni-P-PTFE composite coatings. All disks have different surface free energies (20.11mN/m – 37.47mN/m). Tomato deposit on the coated disks was cleaned with water alone at different flow rates and temperatures. Experimental results of fouled stainless steel disks cleaned with water alone and fouled stainless steel disks cleaned with chemical were used for comparison. Results have shown that the response of cleaning time towards different surface energies is not similar as other works reported on the response of mass fouling build-up towards surface energies. Cleaning tomato deposit with chemical is faster than cleaning with water alone. For the coated disks, not all disks with low surface energy will promise short cleaning time.