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IMPACT OF DIFFERENT FREQUENCIES IN THE ENTRAPMENT OF BACTERIAL PATHOGENS FROM DRINKING WATER USING DIELECTROPHORETIC PHENOMENA

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The article has investigated the removal of water borne pathogens using dielectrophoresis (DEP) filter which is energized by varying the frequency of the applied potential from 10 kHz to 2 MHz with different voltage levels of 5; 10; 15 and 20 V. Separate experiments are conducted in artificially contaminated water samples with Escherichia coli, Staphylococcus aureus and Vibrio cholera up to 2 h. The impact of signal frequency and voltages on DEP based water treatment system has been analyzed statistically. Results have demonstrated that an ac signal of 20 V with frequency range of 500 kHz to 2 MH_z is suitable to remove the tested bacterial population and the rate of removal of E. coli is the highest with a dielectrophoretic filtration efficiency of 77,1%.

Keywords: water borne pathogens, drinking water, frequency, dielectrophoretic phenomena.

INTRODUCTION

Water-borne pathogens have been the primary causative factor for high mortality. The World Health Organization report revealed that more than 2,5 million peoples die in a year throughout the world due to water-borne maladies.Almost 80% of diseases and over one third of mortality in developing countries are caused by the consumption of contaminated water which invoked an increased level of public and professional concern

efficiency of DF for trapping tested organisms has been observed at 20 V and around 500 kHz to 2 MHz frequency.

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