ABSTRACT

Dielectrophoresis (DEP) is a phenomenon where a force can be generated and applied to a dielectric particle when the particle is placed in a non-uniform electric field. Theforce dielectrophoretic comes from the electrical polarization of the particles due to their electrical properties, when the dielectric particles are dissolved in a liquid medium and a non-uniform AC field is carried out, however the power of DEP is limited to assembly due to physical restrictions imposed by the two electrodes which hinder its use for scalable devices. In the end, with a variety of development processes, a new method was finally found by utilizing the output of a tesla coil called teslaphoresis.

In this study, the author has designed a spark gap tesla coil for the process wireless electrophoresis with a tesla coil of the type spark gap tesla coil. This process is carried out to analyze the movement of a ZnO and Fe_2O_3 in water medium by utilizing a tesla coil which produces frequency resonance, frequency resonance occurs when the capacitor, inductor and primary coil are connected in parallel. The meeting of these components produces different input frequencies, namely 500 kHz, 1 MHz, 1.5 MHz and 2 MHz. The four frequency inputs are used to analyze the comparison of the effect of movement on ZnO and Fe_2O_3.

The results obtained in this study are theprocess teslaphoresis using ZnO and Fe_2O_3 form the p-Dep and n-DEP processes. At the input frequency of 1.5 MHz ZnO particles produce a particle diameter of 2 mm collected. At the input frequency of 1.5 MHz Fe_2O_3 particles produce a particle diameter of 4.5 mm away. Withprocess, teslaphoresis this it proves that we can exceed this DEP limit by utilizing the output produced by the tesla coil and it is hoped that this teslaphoresis technique can update conventional DEP techniques.

Keywords: *Dielectrophoresis, Tesla Coil, Teslaphoresis.*