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# Tuning the water-alumina nanofluids impedance and dielectric relaxation by the diffuse coplanar dielectric barrier discharge

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## Abstract

Nanofluids are nowadays representing an exciting tool with significant impact and tremendous potential in several industrial applications. In the present paper, we focus our attention on the tunability of the electrical and dielectric properties of alumina nanoparticle-based nanofluids achieved by preliminary modifying the particle surface charging by a diffuse coplanar dielectric barrier discharge plasma treatment. We produced a parametric study on the tuning of the plasma-treated alumina-based nanofluid electrical response as a function of the selected discharge feeding gases.

## 1 Introduction

Nanofluids are media with significant impact and enormous potential in several industrial applications. Choi [1] coined for the first time the word nanofluid back in 1995. He defined nanofluid as a dispersion of fine nanoparticles of variable sizes in a base fluid. The dispersed

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