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Study and realization of an electrostatic precipitator device

*Med Ali Kouidri, *D.Mahi

*Laboratory of studies and Development of Semiconductor and Dielectric Materials, LeDMaScD,
University Amar Telidji of Laghouat, Algeria
kouidrimedali@yahoo.fr

Abstract

An electrostatic filter is a device consisting of plates (receiving electrodes) arranged vertically between which there vertically tensioned wires (electrodes) are electrically powered by the high voltage. A negative voltage applied to the emitting electrodes, generates the formation of electrons in the vicinity of these, which ionize the gas molecules. These ions are attracted by the collector plates and charge the dust by corona effect on their paths. These dusts are then attracted to the collector plates and adhere to it. Cleaning is provided by the Hammers striking regularly these plates allow to picking up the particles at regular intervals. The dust is thus collected to be evacuated. The obtained results of the different geometries showed that this aspect represents a dominant influence on the design and implementation of corona discharge reactor.

Key words: Electro filter, corona discharge, geometry, electric field, ionization, particles, environment, high voltage.

1. Introduction

Most industrial units located on fertile land in sensitive areas to pollution or appointed on ground water, are a threat to the living and the environment. Table 1 summarizes most of the polluting sources.

Therefore, filtering is one of remediation solutions. The treatment can be done using various materials [1, 2]:

- Cyclones; Ventured scrubbers;
- The dust collectors filter media;
- Electrostatic precipitators.