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## **SEPARATION OF GASES WITHOUT THEIR DECOMPOSITION, USING ELECTROSTATIC FIELD**

The removal of particulate matter from flue and exhaust gases using electrostatic field is a very widely investigated and very successfully applied in daily industrial practice. However, the separation of gases without decomposition or with a minor decomposition using electrostatic field is less researched and not really applied in the industrial practice. The main difficulties are laying in the fact, that by ionization of gases the charging of gas molecules and atoms can be executed rather easily in some cases, but positive and negative charged particles are generated in the same number. To separate the particles of one gas, they must have unipolar ionization, which can be more easily reached if unipolar ionization is taking place, but to generate unipolar charged particle cloud is rather difficult process. For this research at first a mono-polarly charged gas cloud is needed. For that, a so called boxer charger equipment is developed and built using a technology similar to that developed by professor Masuda of the University of Tokyo. After that step, a gas is selected which can be mono-polarly charged, and mixed with some carbon dioxides or methane to start the separation process. At the beginning step NO and nitrogen mixture is used, but the target is to separate H<sub>2</sub>S from methane and carbon dioxide, and finally to separate CO<sub>2</sub> from CH<sub>4</sub>. The research was supported by the grant EFOP-3.6.2-16-2017-00018.