

PLASMA PROCESSES INCLUDING ELECTRON BEAM FOR OFF-GASES PURIFICATION

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Non-thermal plasma technologies based on different methods of plasma generation are being applied for ozone generation for different applications, waste water and off-gases treatment. Plasmas create reactive species, in particular ions, radicals or other reactive compounds, which can decompose pollutant molecules, organic particulate matter or soot. Electron beam flue gas treatment is another plasma-based technology which has been successfully demonstrated on industrial scale coal fired power plants. High efficiency of SO₂ (> 95%) and NO_x (>70%) has been obtained and industrial plant applying this process has been built in Poland. The further investigations carried out all over the world have illustrated that the process can be applied for poly-aromatic hydrocarbons (PAH) destruction as well, and just recently research laboratories in the US and South Korea have reported in the feasibility of the process for mercury removal from the flue gas [1]. The recent studies concern a new type of accelerators implementation in the industrial scale, application of the process in the high sulfur oil fired boilers [2] and Diesel off – gasses purification. The treatment of the flue gases with the high NO_x concentration is a special challenge for the technology since the main energy consumption (and applied accelerators power) is related to this pollutant content in the processed off gases. The pulse beams and scavenger application can be a solution to reduce investment and operational costs. The further development of the technology is directly connected with high power accelerators development [3].

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References

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