

## **Emission of pollutants from circulating fluidized bed boilers**

### **Summary**

Emission of gaseous pollutants and dust using the technology of fluidal combustion is not as well examined as at the traditional technology. Boilers with circulating fluidized bed proved their technical, technological, economical and ecological advantages – they are able to burn coal, muds or waste fuels. Measurement, examinations and analyses of gaseous pollutants and dust emitted by four selected circulating fluidized bed (CFB) boilers at EC Tychy, Elcho Chorzów, EC Katowice, El Jaworzno III (Factory II) were made.

The measurements relate to dust emission, its size distribution, morphology, phase composition and density. There were analyzed dangerous substances – polycyclic aromatic hydrocarbons (PAHs), selected trace elements, polichlorated dibenzodioxins (PCDDD) and polichlorated dibenzofurans (PCDF) located on the surface of dust particles.

Investigations covered CO, SO<sub>2</sub>, NO<sub>2</sub>, HCl, HF, non-methane volatile organic substances. There was used cascade-impactor, which allowed for avoiding errors caused by dust coagulation on a measuring filter.

Except standard methods, gas chromatography, ICP, electron scanning microscope and x-rays spectrometer with energy dispersion (EDS) were used.

Results of measurements, analyses and researches, which were the continuation of previous ones related to emission associated with coal combustion, enabled to estimate emissions from CFB boilers. The synthetic result of research are indexes of emission from fluidized beds of total dust, fractions PM<sub>2.5</sub> and PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CO, HCl, HF, PAHs, and non-methane volatile organics, dioxins and furans expressed in g/Mg of burned fuel. The results confirmed ecological advantages of coal and muds burning in boilers with circulating fluidized bed, in particular a low emission of NO<sub>2</sub>, HCl, HF, dioxins and heavy metals. Due to application of high efficiency electrofilters the emission of dust PM<sub>2.5</sub> is quite low. There was observed conspicuous influence of combustion conditions upon some pollutants emission, particularly on PAHs and CO.