

Operation experiences on industrial and pilot scale flue gas e-beam treatment plants



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Low energy electron beams for industrial and environmental applications

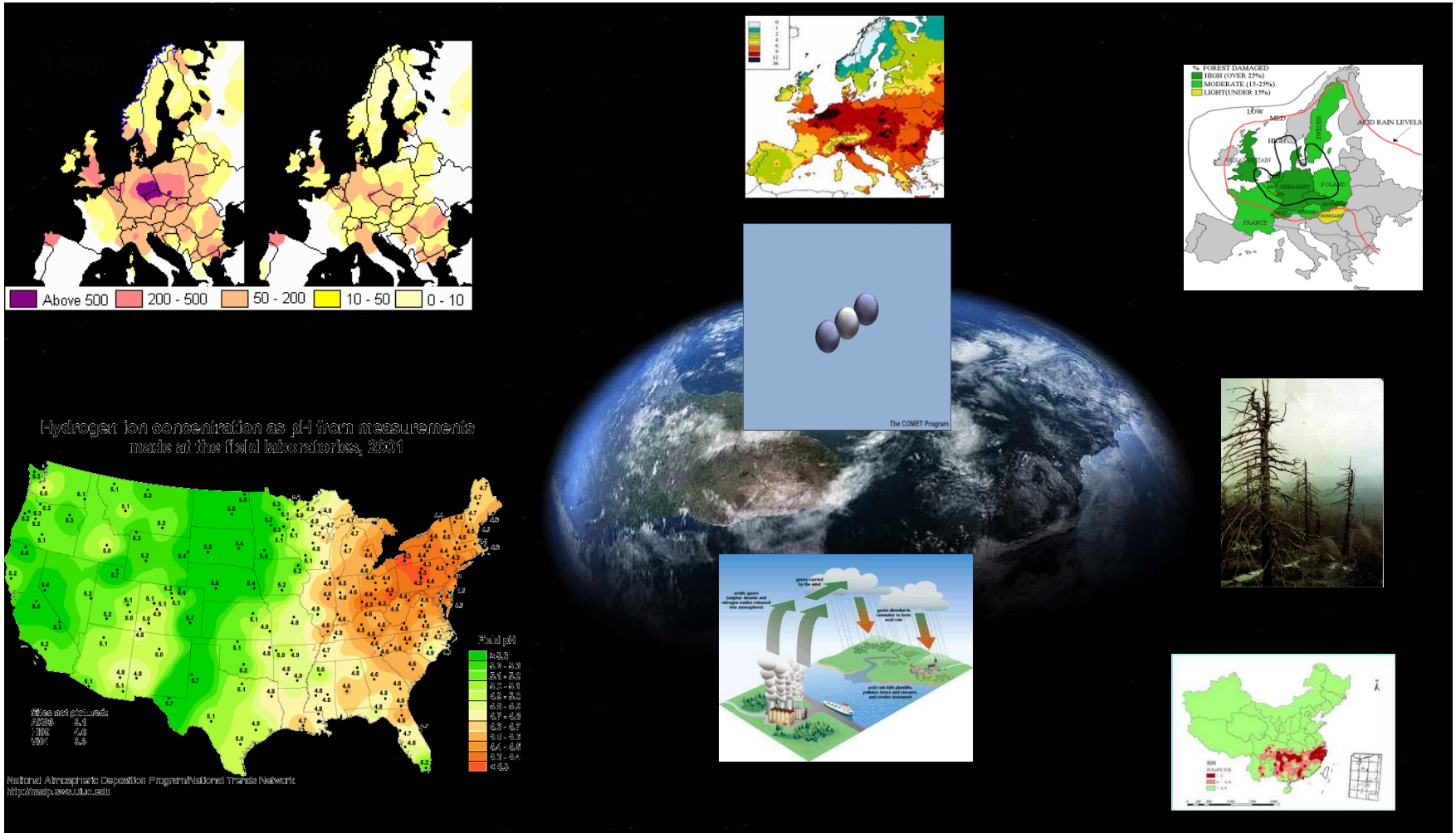
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WUT Centre for Innovation and Technology Transfer Management
Warsaw.Poland

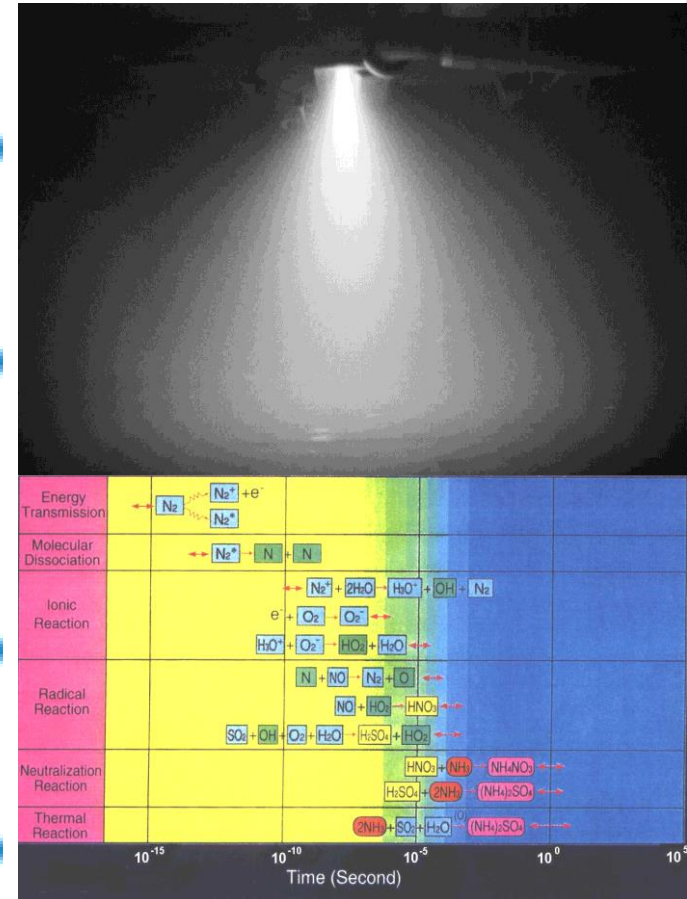
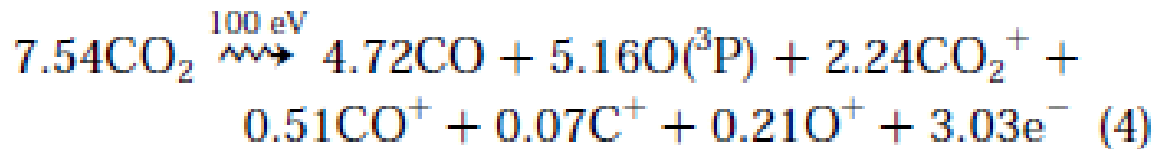
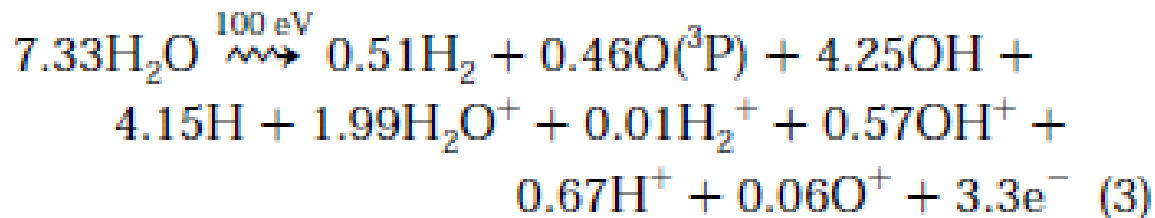
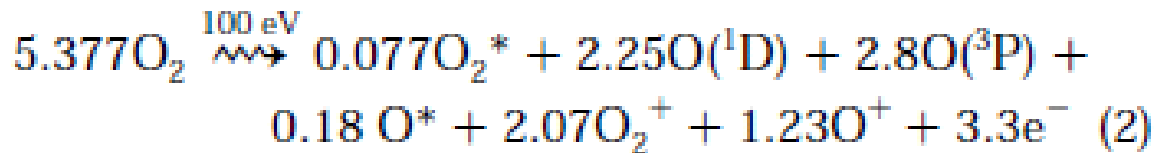
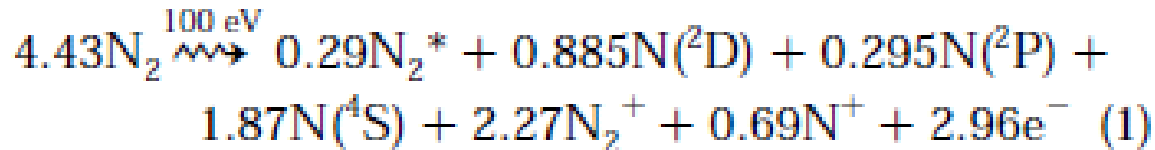
Fossil fuels



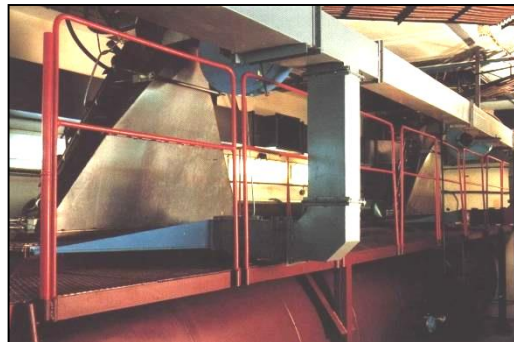
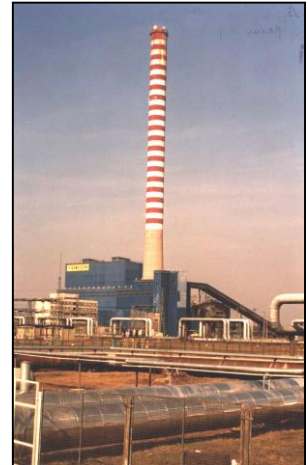
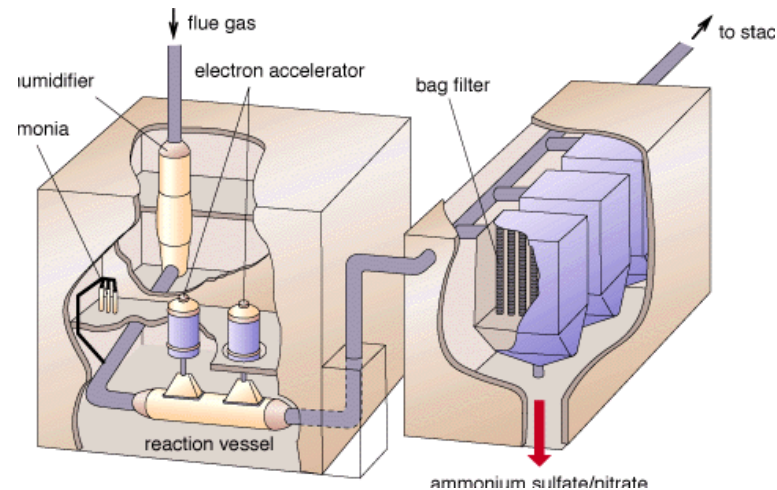
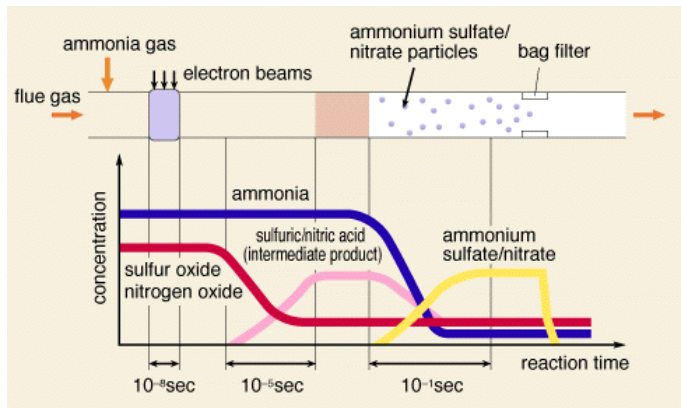
Environmental impact of air pollution



Flue gas electron beam irradiation



Process and its engineering

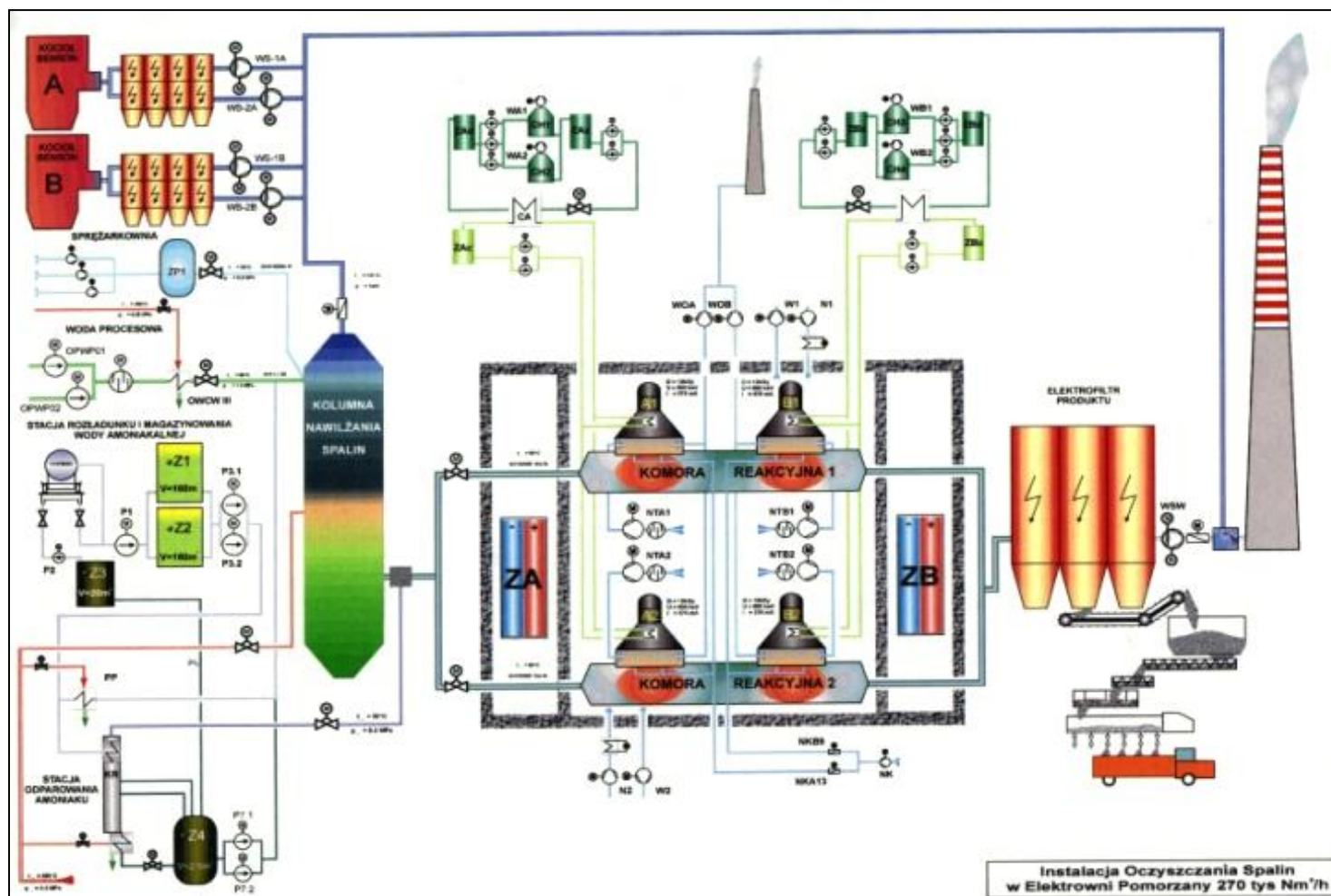


Electron beam plant –common view

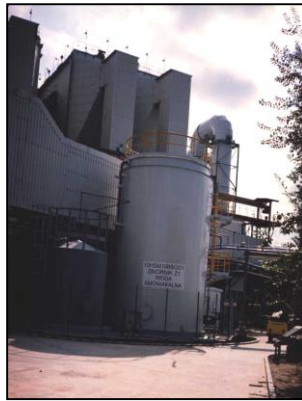
Electron Beam Flue Gas Treatment Plant „Pomorzany”



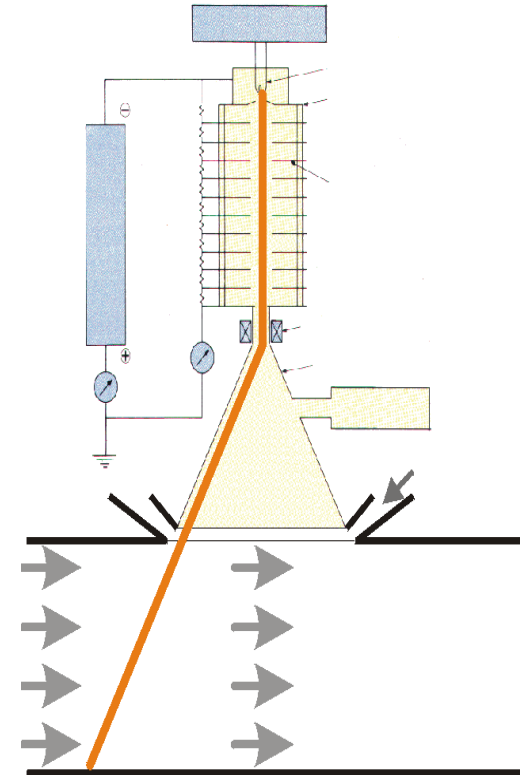
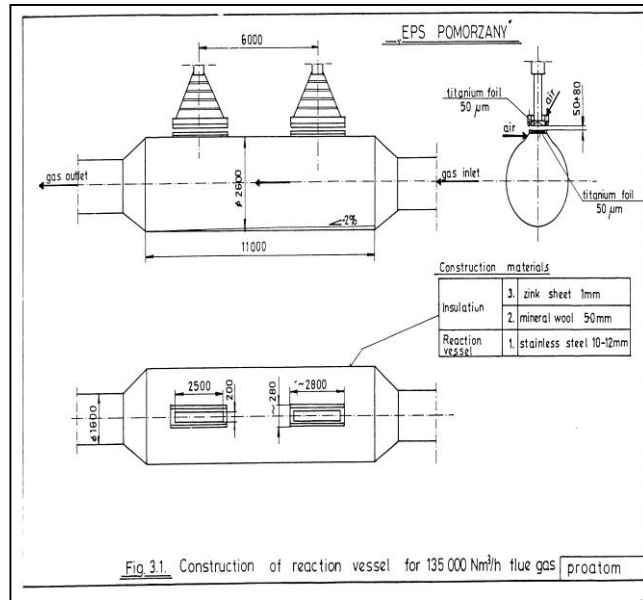
EPS Pomorzany – EBFGT plant



Main units of EBFGT plant



Process vessel and electron beam scanning



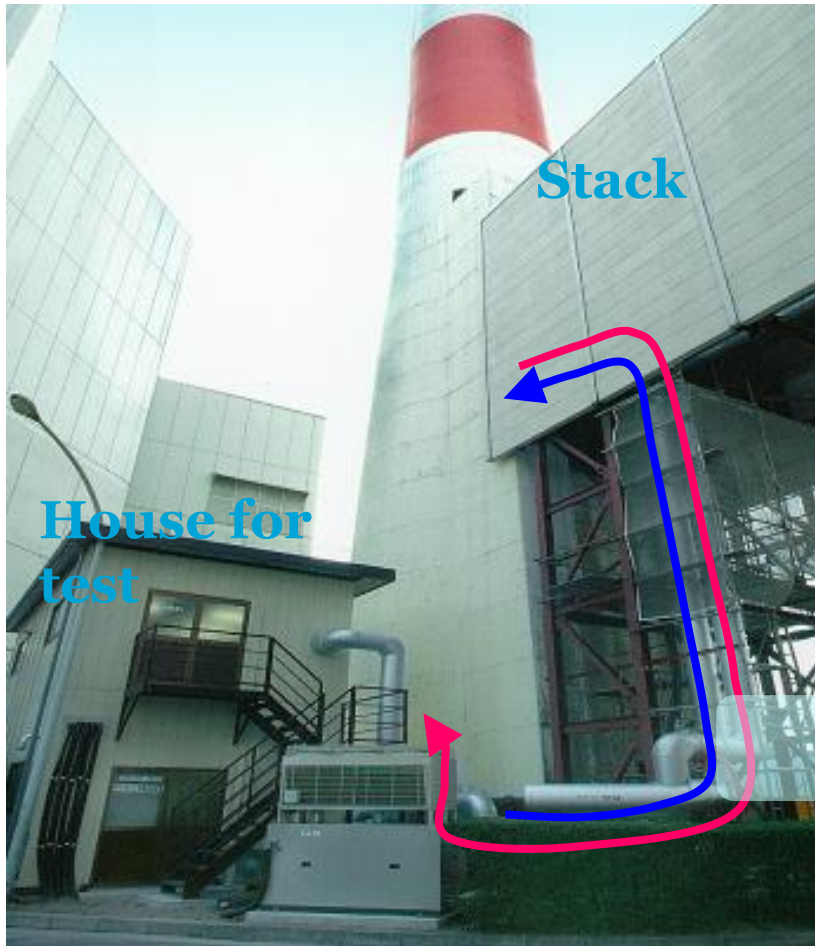
ESP byproduct collector and fertilizer



	P	K	Mg	Ca	S
g/kg	45	20	10	10	10

SUPROFOS 25

Japan – incinerator EBFGT



Electron accelerator & Irradiation vessel



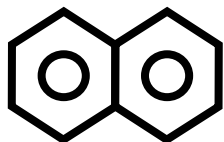
**Self-shielded type and Curtain
beams
300 keV max. and 40 mA max.**

EBFGT – oil fired boiler

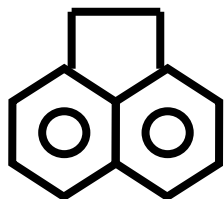


INCT + EBTech ROK

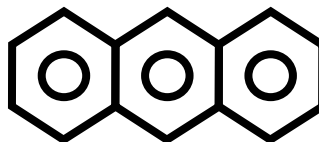
The structures of PAHs emitted from fossil fuels combustion



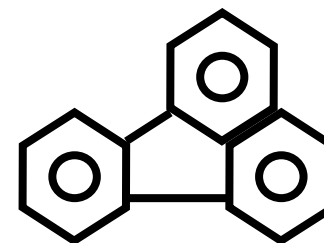
naphthalene



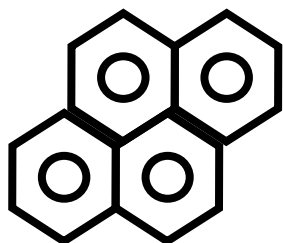
acenaphthene



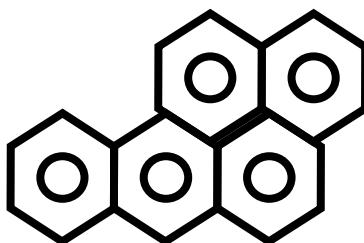
anthracene



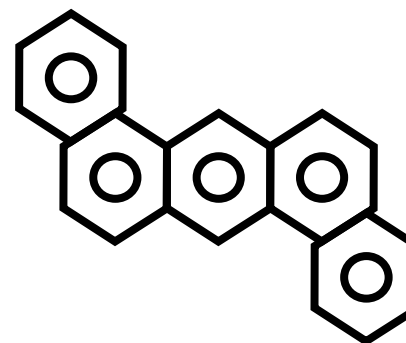
fluoranthene



pyrene

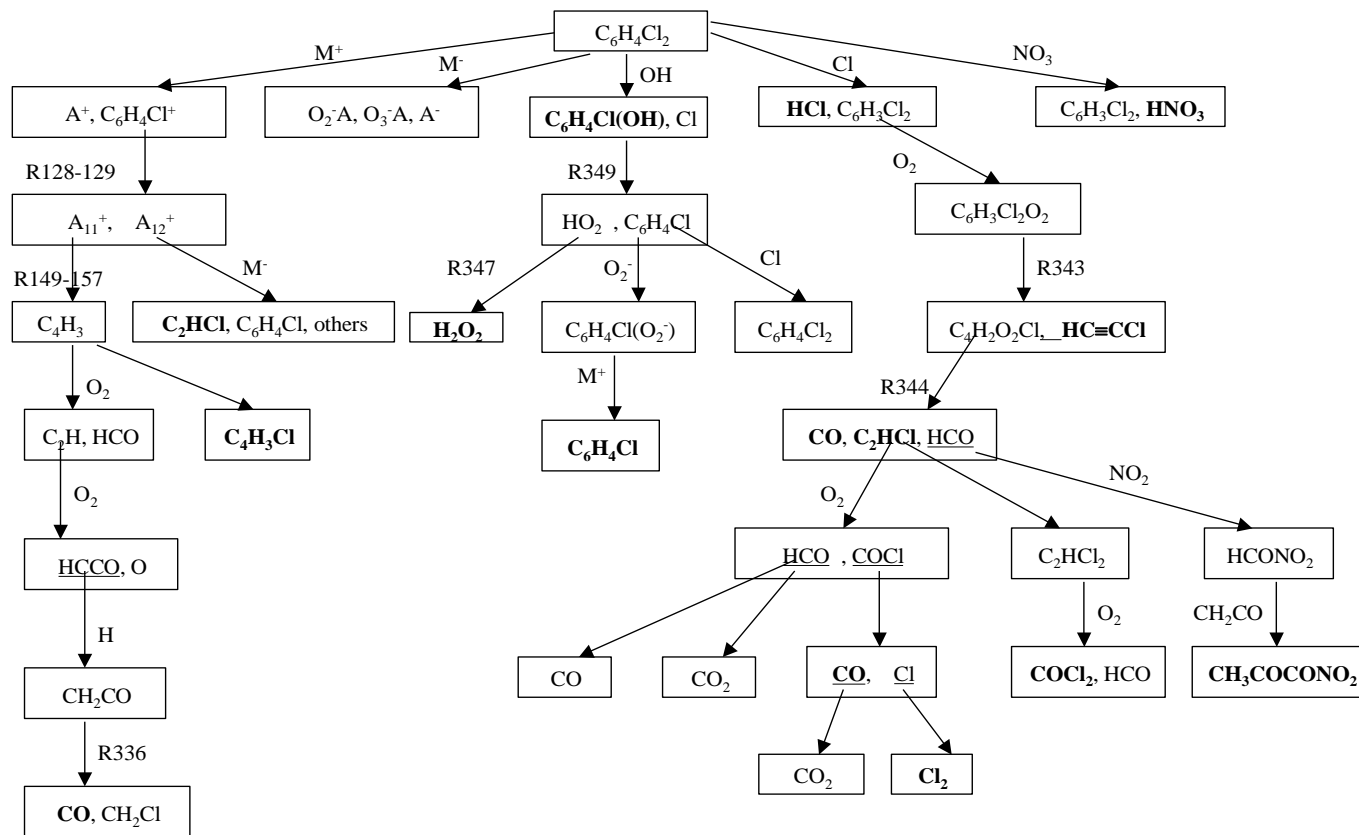


benzo(a)pyrene



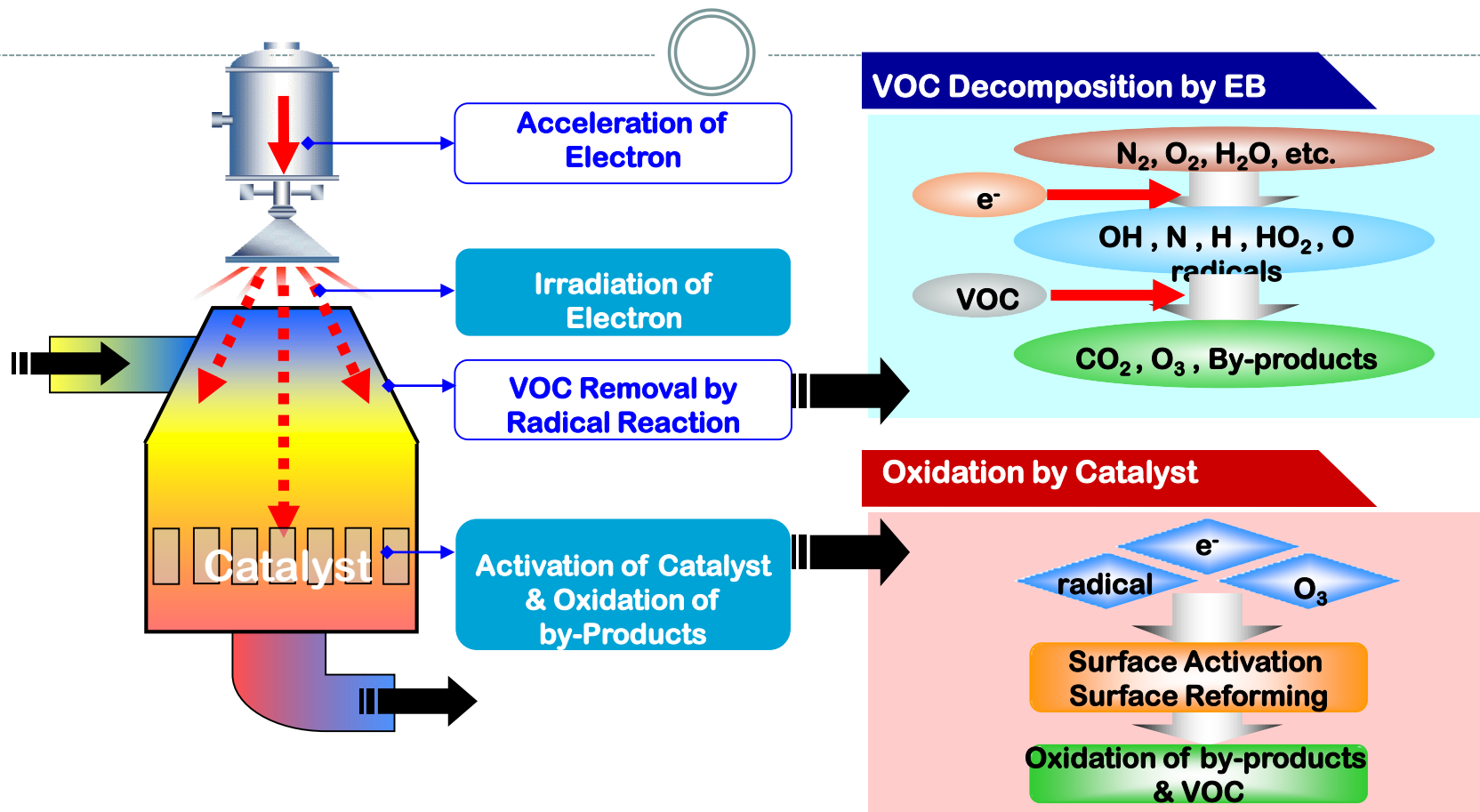
dibenzo(a,h)anthracene

Scheme of reaction pathways of 1,4-DCB decomposition and products formation



Yongxia Sun

Synergy Effect of EBeam – Catalyst Coupling System

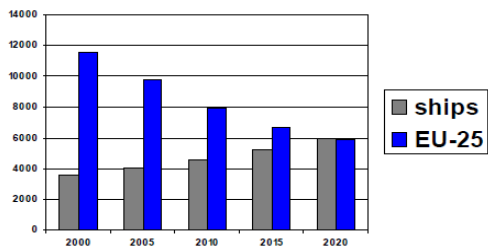
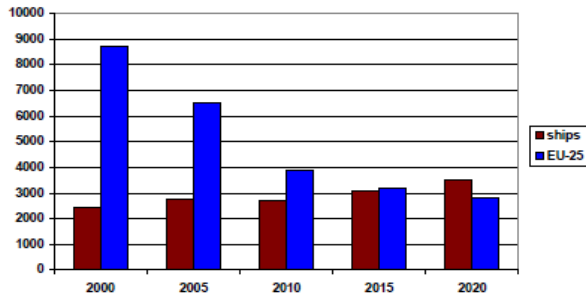
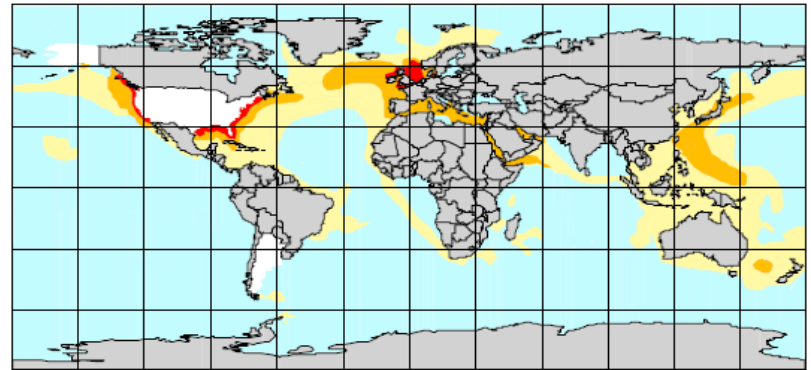


CARGO SHIPS



Traffic density

Low
Medium
High
Extra high



Conclusions



- EBFGT has been proven as effective technology for fossil fuel combustion off-gases purification, from SO_x and NO_x.
- Other possible applications are VOC (PP and PAH) treatment.
- Very new applications – Diesel engine off gases.
- The reliable and economical electron accelerators are the main components to assure technology wide implementation.

