Geophysical Research Abstracts, Vol. 7, 08020, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08020

Flue gas injection into workings and gob zones of abandoned coal mines

A. Busch (1), B.M. Krooss (1)

(1) Institute of Geology and Geochemistry of Petroleum and Coal, RWTH-Aachen University, Germany, (busch@lek.rwth-aachen.de / Fax: +49 241 80 92152)

Recently, science, economy and politics try to identify options for reducing CO_2-emissions to meet the Kyoto-agreement. These efforts include various geological storage options, clean coal approaches or just promoting a new awareness in the public to reduce emissions due to individual energy consumption or traffic.

Subsurface storage of CO_2 or flue gas in abandoned coal mines is generally not considered a prime option for the reduction of carbon dioxide emissions. In the context of the reduction of coal mining operations throughout Central Europe this storage option might however become relevant temporarily and locally in areas with appropriate infrastructure. Therefore it is currently being investigated in the context of national GEOTECHNOLOGIEN research program initiated by the German Federal Ministry of Education and Research.

Due to their high gas sorption capacity, coal and dispersed organic matter are considered as promising targets for subsurface storage of CO_2. The feasibility of CO_2 storage in the workings and gob zones of abandoned coal mines are a topic that has not been addressed in detail so far. While most CO_2 storage studies focus on the injection of pure CO_2 the approach presented here aims a feasibility assessment of direct injection of flue gas in order to reduce separation costs.

The use of gob areas and formation damage zones in and around abandoned coal mines might provide a promising alternative to storing CO_2 in unminable coal seams (as investigated in the RECOPOL project of the EC). These damage zones offer various advantages: (i) they possess higher permeabilities than unmined coal seams; (ii) they provide access to significant volumes of unmined coal, dispersed sedimentary organic matter and mineral surfaces with potentially high CO_2 sorption capacities; (iii) the

geological situation in the mining areas is usually well known; (iv) long-term gas (methane) monitoring and water management plans are operational in these areas for public safety reasons (little additional investment required for CO_2 monitoring).

Details of the conceptual approach, storage scenarios and first estimates on quantitative aspects of this storage option will be presented.