



CO₂ Capture using Amine Processes:
International Cooperation and Exchange

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**Report describing model validation results including
recommendations for modelling guidelines and
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3				



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Public Summary

This CAPRICE deliverable D1.3:

Report describing model validation results including recommendations for modelling guidelines and further experiments

Currently, there is no commercial post combustion carbon capture plant integrated into large power generation plants and other chemical process utilities except for bench scale and demonstration plants. Thus, a comprehension of experimental pilot plants becomes essential to put carbon capture technology for use in commercial or large scale plants. This has led to the launch of the CAPRICE consortium which is an international cooperation and exchange between an EU consortium and a Canadian consortium. The objectives of this agreement is to share experience in the carbon capture processes from pilot plants located at ITC, Canada; Esbjerg CASTOR (Dong); the University of Keiserslautern(pilot results from University of Stuttgart (ITT)); and SINTEF/NTNU, to test various process simulators, and to give recommendations regarding pilot operation and simulator performance.

This report is a follow up of CAPRICE deliverable D1.1(Luo et al(2008)) Report and data base on validated pilot plant data

It contains the results and conclusions from the testing of 6 different simulators on sixteen data sets from the four different pilot plant studies based on 30 wt% MEA solution as solvent. Of the simulators four were commercial simulators and two in-house codes. The pilot plants were located as given above and the simulators tested were: ASPEN RadFrac, ASPEN RateSep, ProTreat, ProMax as the commercial ones, and ChemiSim by BASF and CO2SIM by SINTEF/NTNU as the in-house codes.

The simulations were performed on an as equal basis as possible given the constraints of the various simulators. Basically all the simulators are capable of giving reasonable predictions on overall performance, i.e. CO₂ absorption rate. The reboiler duties are less well predicted with some scatter, but still reasonable. Concentration profiles in gas and liquid could also be reasonably well predicted. However, temperature profiles were quite scattered. This gives confidence in simulation results obtained from such tools, but at the same time gives ample room for improvement.

The rest of this document is project confidential