Author(s): Greer, T (Greer, T.); Bedelbayev, A (Bedelbayev, A.); Igreja, JM (Igreja, J. M.); Gomes, JF (Gomes, J. F.); Lie, B (Lie, B.)

Title: A simulation study on the abatement of CO2 emissions by de-absorption with monoethanolamine

Source: Environmental Techonolgy, 31 (1): 107-115 2010

Language: English

Document Type: Article

Author Keywords: CO2 de-absorption; Dynamic model; Amine

KeyWords Plus: Power-Plants; Capture; Technology

Abstract: Because of the adverse effect of CO2 from fossil fuel combustion on the earth's ecosystems, the most cost-effective method for CO2 capture is an important area of research. The predominant process for CO2 capture currently employed by industry is chemical absorption in amine solutions. A dynamic model for the de-absorption process was developed with monoethanolamine (MEA) solution. Henry's law was used for modelling the vapour phase equilibrium of the CO2, and fugacity ratios calculated by the Peng-Robinson equation of state (EOS) were used for H2O, MEA, N-2 and O-2. Chemical reactions between CO2 and MEA were included in the model along with the enhancement factor for chemical absorption. Liquid and vapour energy balances were developed to calculate the liquid and vapour temperature, respectively.

Addresses: [Igreja, J. M.; Gomes, J. F.] ISEL, Dept Chem Engn, Lisbon, Portugal; [Greer, T.; Lie, B.] Telemark Univ Coll, Fac Technol, Porsgrunn, Norway; [Gomes, J. F.] CEQB IBB, Inst Super Tecn, P-1049001 Lisbon, Portugal

Reprint Address: Gomes, JF, ISEL, Dept Chem Engn, Lisbon, Portugal.

E-mail Address: jgomes@deq.isel.ipl.pt

Publisher: Taylor & Francis LTD

Publisher Address: 4 PARK SQUARE, MILTON PARK, ABINGDON OX14 4RN, Oxon, ENGLAND

ISSN: 0959-3330

DOI: 10.1080/09593330903373764

ISO Source Abbrev.: Environ. Technol.

ISI Document Delivery No.: 546NN