The teraton challenge. A review of fixation and transformation of carbon dioxide

The increase in atmospheric carbon dioxide is linked to climate changes; hence there is an urgent need to reduce the accumulation of CO2 in the atmosphere. The utilization of CO2 as a raw material in the synthesis of chemicals and liquid energy carriers offers a way to mitigate the increasing CO2 buildup. This review covers six important CO2 transformations namely: chemical transformations, photochemical reductions, chemical and electrochemical reductions, biological conversions, reforming and inorganic transformations. Furthermore, the vast research area of carbon capture and storage is reviewed briefly. This review is intended as an introduction to CO2, its synthetic reactions and their possible role in future CO2 mitigation schemes that has to match the scale of man-made CO2 in the atmosphere, which rapidly approaches 1 teraton.

General information
Publication status: Published
Organisations: Solar Energy Programme, Risø National Laboratory for Sustainable Energy
Contributors: Mikkelsen, M., Jørgensen, M., Krebs, F. C.
Pages: 43-81
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Energy & Environmental Science
Volume: 3
ISSN (Print): 1754-5692
Ratings:
Scopus rating (2010): SJR 3.87 SNIP 2.411
Web of Science (2010): Indexed yes
Original language: English
Keywords: Polymer solar cells, Solar energy
DOIs:
10.1039/b912904a

Bibliographical note
This work was supported by The Danish Research Council for Technology and Production Sciences (FTP 274-05-0356).
Source: orbit
Source-ID: 256636

Research output: Contribution to journal › Journal article – Annual report year: 2010 › Research › peer-review