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| 3 | **Citations:** 82 | **PRE-COMBUSTION CAPTURE OF CARBON DIOXIDE IN A FIXED BED REACTOR USING THE CLATHRATE HYDRATE PROCESS**  |
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| 4 | **Citations:** 76 | **A NEW APPARATUS TO ENHANCE THE RATE OF GAS HYDRATE FORMATION: APPLICATION TO CAPTURE OF CARBON DIOXIDE**  |
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DIRECTIONS

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Source: APPL ENERG 122: 112-132 JUN 1 2014

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6 Citations: 47

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Authors: KUMAR A; SAKPAL T; LINGA P; KUMAR R

Source: FUEL 105: 664-671 MAR 2013


Field: ENGINEERING

7 Citations: 33

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Authors: BABU P; KUMAR R; LINGA P

Source: INT J GREENH GAS CONTROL 17: 206-214 SEP 2013

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8 Citations: 12

Title: A REVIEW OF THE HYDRATE BASED GAS SEPARATION (HBGS) PROCESS FOR CARBON DIOXIDE PRE-COMBUSTION CAPTURE

Authors: BABU P; LINGA P; KUMAR R; ENGLEZOS P

Source: ENERGY 85: 261-279 JUN 1 2015

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   **Source:** FUEL 105: 664-671 MAR 2013
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HIGHLY CITED PAPERS FOR (LINGA P)

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