

論文 / 著書情報  
Article / Book Information

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| 題目(和文)            |                                                                                                                                                                                                |
| Title(English)    | Material Development of Calcium Oxide-Based Media for Thermochemical Energy Storage                                                                                                            |
| 著者(和文)            | GuoRui                                                                                                                                                                                         |
| Author(English)   | Rui Guo                                                                                                                                                                                        |
| 出典(和文)            | 学位:博士(工学),<br>学位授与機関:東京工業大学,<br>報告番号:甲第11824号,<br>授与年月日:2022年3月26日,<br>学位の種別:課程博士,<br>審査員:加藤 之貴,小林 能直,塚原 剛彦,原田 琢也,吉田 克己                                                                        |
| Citation(English) | Degree:Doctor (Engineering),<br>Conferring organization: Tokyo Institute of Technology,<br>Report number:甲第11824号,<br>Conferred date:2022/3/26,<br>Degree Type:Course doctor,<br>Examiner:,,,, |
| 学位種別(和文)          | 博士論文                                                                                                                                                                                           |
| Category(English) | Doctoral Thesis                                                                                                                                                                                |
| 種別(和文)            | 要約                                                                                                                                                                                             |
| Type(English)     | Outline                                                                                                                                                                                        |

# 論文要約

THESIS OUTLINE

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|-----------------------------------------------------------|----------------|----------|
| 系・コース：<br><small>Department of, Graduate major in</small> | 応用化学系<br>原子核工学 | 系<br>コース |
| 学生氏名：<br><small>Student's Name</small>                    | GUO Rui        |          |

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|---------------------------------------------------------|-----------------|------|
| 申請学位（専攻分野）：<br><small>Academic Degree Requested</small> | 博士<br>Doctor of | （工学） |
| 指導教員（主）：<br><small>Academic Supervisor(main)</small>    | 加藤之貴 教授         |      |
| 指導教員（副）：<br><small>Academic Supervisor(sub)</small>     |                 |      |

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| 論文題目<br>Thesis Title | Material Development of Calcium Oxide-Based Media for Thermochemical Energy Storage |
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## 要約

CaO/Ca(OH)<sub>2</sub> thermochemical energy storage system (TCES) is a promising technology to alleviate the energy-crisis issues economically and environmental-friendly. However, TCES system has not been widely and commercially constructed yet because of its limitation and unsatisfying performance in long-term operations, e.g., the agglomeration problem, bulk volume change issue, low mechanical stability characteristics and low thermal conductivity shortcomings. With the modification by appropriate additives, the issues or drawbacks from raw materials can be compensated in some extent. Therefore, the objective of this study is to alleviate the above issues by material modification, that is to develop calcium oxide-based composite materials with upstanding reactivity, superior output/storage density, and adequate mechanical stability. In addition, to further understand the performances of the TCES system combined with nuclear power plants, one Nuclear-TCES combined system is proposed and evaluated environmentally and economically.