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2015年

（筑波大学）

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内容記述 | この博士論文は内容の要約のみの公開（または一部非公開）になっています
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その他のタイトル | 洪水及び津波に被災した紙文書を救済するための塩水保存法の活用：塩と紙の相互作用と脱塩工程の研究
学位授与大学 | 筑波大学
学位授与年度 | 2015
報告番号 | 未定

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A Dissertation Submitted to
The Graduate School of Life and Environmental Sciences,
The University of Tsukuba
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in Bioresource Engineering
(Doctoral program in Appropriate Technology and Sciences for Sustainable Development)

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Summary

The saltwater immersion method is promoted as a new comprehensive method for rescuing flood- and tsunami-damaged paper-based documents. The complete process for this method is suggested to contain 3 sub-processes as listed in the following.

- Saltwater immersion for preventing mold growth as well as stabilizing the fiber swelling and paper components.

- Desalination process for recovering paper strength after saltwater immersion
  - Electrodialysis functioned as an effective post-treatment in order to reduce the salt concentration of the fluid in which damaged books and stacked documents were immersed.
  - Desalination by carbonation to generate CaCO$_3$ inside paper was suggested for a dual purpose of desalination and neutralization concurrently. CaCO$_3$ reproduction by the NH$_4$HCO$_3$ immersion method was highly recommended due to a high rate of CaCO$_3$ crystal production together with a substantial decrease of deliquescent salt and consequently led to low moisture content of paper which increased the tensile strength of paper.

- Quick drying process with TBA after desalination process
  - TBA drying method is desirable for a large-scale drying treatment of flood-damaged documents and books produced by commercial printing methods such as offset and laser printing because inks and toners were never blurred or washed away. Paper strength was favorably maintained so that it was easy to handle documents even when they were wet with TBA. In addition, TBA enabled easy separation between adhered pages that could not be achieved with water.