

### Effects of PCC -adding techniques for the improvement of ONP refresh rates

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In order to improve the refresh rate of old newspaper(ONP), PCC shape-controlling experiments were carried out. The effect of a PCC polymorph on improving the quality of old newspaper was studied for a transformation from waste paper to eco -friendly paper. PCC is prepared during the in -situ process and the loading process to enhance the refresh rate of old newspaper. The characteristics of PCC between the in -situ process and the loading process could be analysed by SEM. The retention rate ranges from 65% to 67% after the application of the in -situ process, and that after the loading process ranges from 55 to 58%. The retention rates thus show a difference of about 7-10%. In addition, the whiteness and ERIC characteristic of the in -situ process gave more efficient results than those of the loading process.