Foaming of waste cathode ray tube panel glass via CaCO3

König, Jakob; Petersen, Rasmus Rosenlund; Yue, Yuankheng

Publication date: 2012

Document Version
Early version, also known as pre-print

Link to publication from Aalborg University

Citation for published version (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Users may download and print one copy of any publication from the public portal for the purpose of private study or research.

You may not further distribute the material or use it for any profit-making activity or commercial gain

You may freely distribute the URL identifying the publication in the public portal

Take down policy
If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from vbn.aau.dk on: October 20, 2019
Foaming of waste cathode ray tube panel glass via CaCO₃

Jakob König, Rasmus R. Petersen, Yuanzheng Yue
Section of Chemistry, Aalborg University, DK-9000 Aalborg, Denmark
jk@bio.aau.dk

The disposal of obsolete electrical and electronic equipment has become a global environmental problem. However, with responsible collecting, dismantling and materials separation, majority of materials can be recycled. Cathode ray tube (CRT) glass represents as much as two-thirds of the weight of a TV. In general CRT consists of two types of glasses: barium/strontium containing glass (panel glass) and lead containing glass (funnel and panel glass). In this work we present the possibility to produce high quality foam glass from the recycled lead-free glass. We study the influence of foaming parameters on the characteristics of foam.

CRT panel glass was crushed, milled and sieved below 63 μm. CaCO₃ was used as a foaming agent and was mixed with glass powders by means of a planetary ball mill. Preliminary results show that milling conditions and particle size have a major influence on the foaming process and resulting density of samples. We investigate the influence of foaming agent concentration on the foaming process, foam density, foam porosity and homogeneity. We demonstrate how milling and foaming conditions affect the foam properties for different amounts of CaCO₃. A minimum in the density of foams has been observed with respect to milling time, while homogeneity of foam has been improved with longer milling time. The results also show that for a higher content of foaming agent the milling time needs to be prolonged in order to obtain lower density and homogeneous porosity. Such behavior is due to stronger interaction between the glass and CaCO₃ particles, which lowers the decomposition temperature of the foaming agent.