

Energy recovery and utilization from waste printed circuit boards

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Electronic waste is one of the fastest growing waste streams in the world and printed circuit boards (PCB) are the most valuable fraction of this stream due to the presence of gold, silver, copper, and palladium. Printed circuit boards consist of approximately 30% metal and 70% non-metals. The non-metal fraction is composed of 60-65% fiberglass and 35-40% organics, in the form of surface-mount plastics and epoxy resins in the printed circuit board laminates. The organics in the non-metal fraction provide a potential alternative source of energy, but hazardous flame retardants contained in the epoxy resins and the presence of residual metals create challenges for utilizing this material for energy recovery. This research provides an evaluation regarding the energy content of printed circuit boards. Density-based separation processes were used to separate the various components of the boards to increase the energy content in specific density fraction while reducing the

metal content. The content of the hazardous flame retardants and residual metals was analyzed to evaluate the harmful effect of emissions produced from utilizing the non-metal fraction as an alternative feed stock in waste-to-energy applications.

Speaker Biography

Maria Holuszko has more than 25 years of experience in Mineral and Coal Processing Engineering working with industry, academia, and government. Her first position was at the University of Alberta, followed by the Alberta Research Council. In the 1990s she held a senior Licensed Scientist position at the British Columbia Ministry of Energy in Victoria, B.C., and she was engaged in consulting work for the mining industry before she decided to pursue her PhD studies at UBC. After completing her PhD degree in 2006, she moved to Australia to work at the Julius Kruttschnitt Mineral Research Centre, the center of excellence for mineral processing at the University of Queensland. In 2011, she returned to work for the industry as a Senior Research Engineer at Teck Resources until she joined the UBC Mining Engineering department as Assistant Professor in 2014.

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