

9<sup>th</sup> World Convention on

## WASTE RECYCLING AND REUSE

March 11-12, 2019 Singapore

**Co, Li, Cu and Al recovery from the stream of spent galvanic cells of the second lithium-ion type with methods of chemical metallurgy**Amelia Zielinska<sup>1</sup> and Agnieszka Sobianowska-Turek<sup>2</sup><sup>1</sup>Poltegor-Institute, Poland<sup>2</sup>Wroclaw University of Science and Technology, Poland

Chemical Lithium-ion (Li-ion) energy sources dominate the market for second-class batteries (accumulators), almost all mobile phones and portable computers are powered by lithium cells. In addition, a new branch of the industry that generates demand for Li-ion batteries is the growing market for electric and hybrid cars. Lithium-ion batteries contain a number of valuable metals, such as Co, Li, Cu and Al. Cobalt is one of the less frequent metals in the Earth's crust, hence its market value is high-80,490 \$/MT and profitable recovery. Lithium recovery will be important in the perspective of the development of electric car production-the current price of 16,500 \$/MT. Mass production of vehicles powered by Li-ion batteries will increase the demand for lithium, so its price will increase and the recovery will be profitable. Another argument in favor of recycling batteries is the need to protect the environment against heavy metal pollution or complex organic substances in their composition. This work presents the results of tests for the recovery of Co, Li, Cu and Al metals by chemical metallurgy using a mixture of formic acid, glutaric acid and perhydrol as leaching agents and sodium hydroxide as a precipitating agent. The conducted research led to the recovery of metals at a level above 85%.

**Biography**

Amelia Zielinska has completed her PhD research from Wroclaw University of Science and Technology. She is the Director of Laboratory of Chemical Examination of Water. Her research interests focus on thermal e-waste treatment and hazardous waste recycling.

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