

## **Dehydration of perlite glass from Slovakia**

PETER VARGA<sup>1</sup>, PETER UHLÍK<sup>1</sup>, JAROSLAV LEXA<sup>2</sup>,  
VALÉRIA BIZOVSKÁ<sup>2</sup>, JURAJ ŠURKA<sup>3</sup>, LENKA  
MARKOVÁ<sup>1</sup>, HELENA PÁLKOVÁ<sup>2</sup>

<sup>1</sup> Comenius University in Bratislava Slovakia,  
vargap@fns.uniba.sk

<sup>2</sup> Slovak Academy of Sciences, Bratislava, Slovakia

<sup>3</sup> Slovak Academy of Sciences, Banská Bystrica, Slovakia

The water in perlite is one of the most important factors allowing production of expanded perlite – the main commercial perlite product. The purpose of this study is to determine amount and kind of water in raw perlite from the most important deposits in Slovak Republic. In addition to thermal analysis and loss on ignition, the infrared (IR) spectroscopy in the near IR region was also a useful method for observation of water present in perlite because the area of combination vibration band of water ( $\sim 5240 \text{ cm}^{-1}$ ) reflects the amount of water. The dehydration of the perlite was observed at the different time and temperature. The dehydration of perlite was slow at 150 °C about 30 % of total water was released after 72 hours of drying. The highest increase of molecular water loss was observed between 150 and 250 °C during 3.5 hours of dehydration. A rate of released water was sluggish and stabilised at about 70 % of total water at 250 °C and over 15 hours of dehydration. Almost entire molecular water was released after 15 hours of treatments at 550 °C. The released of water is very quick at higher temperatures e.g.: at 850 °C about 80 % of total water was escaped after 1 minute of heating and almost total water was released during 5 minutes of heating. The authors are grateful to the Slovak Research and Development Agency for the support of the project APVV-0339-12.