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## BOOK OF ABSTRACTS

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## Obtaining of expanded graphite using a thermal method

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This article reports a new way to prepare expanded graphite using a thermal method. Natural graphite was added to crystalline hydrate of metals with mechanical stirring at room temperature, taken in the number of 20-80% of the mass of mix. This was then placed in muffle furnace. All process of activation takes from 10 to 20 minutes. X-ray diffraction patterns were used to analyze the structure and confirm that expanded graphite had indeed been prepared. A scanning electron microscope was utilized to observe the morphologies of the expandable graphite and expanded graphite.

Expandable graphite (EG) is a type of graphite intercalation compound (GIC). Its derivatives are functional carbon materials that can be applied in various fields, such as airtight materials, oil absorbents, flame retardants, high-power batteries, electrodes, and military materials [1-4].

V. Sridhar [5] reported that GICs can be obtained only by one-step at room temperature with intercalation by concentrated sulfuric acid and ammonium persulfate. The resultant EG (denoted as RTEG) exhibits an expanded volume (EV) of up to 225 ml/g. Finally, the excessive usage of concentrated H<sub>2</sub>SO<sub>4</sub> as the intercalant in the conventional method can also cause serious environmental pollution [6]. Therefore, it is of great value to seek a simpler and less-polluted approach to prepare EG.

In this work are used native graphite and crystalline hydrates of metals. The graphite from the Zavalye Graphite Plant (Ukraine) is a large-scale natural graphite subjected to chemical desalination under industrial conditions. The result is achieved by mechanical mixing of powder of initial graphite by the making foam agent by crystalline hydrate of metals for training of porous structure, taken in the number of 20-80% of the mass of mix. First, NG (2 g) was added to crystalline hydrate of metals (8 g) with mechanical stirring for 1 min at room temperature. This was then placed in muffle furnace. The muffle furnace was sealed and quickly heated to the desired temperature. Where it was maintained for 20 minutes. It was allowed to cool to room temperature naturally. The expanded volume was determined by expanding of the EG and then measuring its volume with a graduated cylinder. So, the experiment proceeds in two stages: 1) mixing of graphite with crystalline hydrate of metals; 2) and heating of components at a temperature of 350-1000°C. The mix heats up 5-10 minutes. All process of activation takes from 10 to 20 minutes.

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