

**RESEARCH OF STRUCTURE AND PHYSICAL AND CHEMICAL
PROPERTIES POLYSTYRENE COMPOSITIONS IT IS FILLED WITH
THE ANGREN SECONDARY KAOLIN**

**Kamalova D.I.¹, Negmatov S.S.², Umarov A.V.³, Abed N.S.⁴ (Republic of
Uzbekistan) Email: Kamalova510@scientifictext.ru**

¹*Kamalova Dilnavoz Ikhtiyorovna - PhD Student;*

²*Negmatov Sayibjon Sadikovich - DSc in technics, Professor, Academician;*

³*Umarov Abdusalam Vakhitovich - Doctor of the technical sciences, Professor;*

⁴*Abed Nodira Sayibjonovna - Doctor of the technical sciences, Professor,*

STATE UNITARY ENTERPRISE "FAN VA TARAQQIYOT",

TASHKENT STATE TECHNICAL UNIVERSITY,

TASHKENT, REPUBLIC OF UZBEKISTAN

Abstract: *in this work results a research of structure of physical and chemical properties polystyrene compositions which are filled with the Angren secondary kaolin are considered. In this work with the help of structural researches as spectroscopic ways VS (visible), IR (infrared) and EPR (electron paramagnet resonance) of the composites of polystyrene filled with a kaolin are shown to – formation of a chemical bond between components of composites in their interphase layers. And also the new magnetic properties shown by these composites were analysed. The thermogram of kaolinite from the Angren ceramic plant is provided in article and the sample of the enriched kaolin brought from the Angren ceramic plant was subjected to derivatographical researches.*

Keywords: *thermographical analysis, thermogram, temperature, temperature interval, kaolin, kaolinite, polystyrene, polystyrene compositions, physical and chemical properties, structure.*

**ИССЛЕДОВАНИЕ СТРУКТУРЫ И ФИЗИКО-ХИМИЧЕСКИХ
СВОЙСТВ ПОЛИСТИРОЛОВЫХ КОМПОЗИЦИЙ, НАПОЛНЕННЫХ
АНГРЕНСКИМ ВТОРИЧНЫМ КАОЛИНОМ**

**Камалова Д.И.¹, Негматов С.С.², Умаров А.В.³, Абед Н.С.⁴
(Республика Узбекистан)**

¹*Камалова Дилнавоз Ихтиёрровна - базовый докторант;*

²*Негматов Сайибжон Содикович - доктор технических наук, профессор,
академик;*

³*Умаров Абдусалам Вахитович - доктор технических наук, профессор;*

⁴*Абед Нодира Сайибжоновна - доктор технических наук, профессор,*

Государственное унитарное предприятие "Фан ва тараккиёт"

Ташкентский государственный технический университет,

г. Ташкент, Республика Узбекистан

Аннотация: в данной работе рассматриваются результаты исследования структуры физико-химических свойств полистироловых композиций, которые наполнены Ангренским вторичным каолином. В данной работе с помощью структурных исследований спектроскопическими способами ВД (видимым), ИК (инфракрасным) и ЭПР (электронно-парамагнитно резонансом) наполненных каолином композитов полистирола показаны – образование химической связи между компонентами композитов в их межфазных слоях. А также были проанализированы новые магнитные свойства, проявляемые этими композитами. В статье приведена термограмма каолинита с Ангренского керамического комбината и дериватографическим исследованиям был подвергнут образец обогащенного каолина, привезенного с Ангренского керамического комбината.

Ключевые слова: термографический анализ, термограмма, температура, температурный интервал, каолин, каолинит, полистирол, полистироловые композиции, физико-химические свойств, структура.

The physical and chemical processes proceeding in skilled masses at heat treatment were studied by method of complex thermographical analysis. Thermographic researches are conducted on the Hungarian derivatograph of the “Paulik” brand in a temperature interval from 20 to 1000°C. The sample of the enriched kaolin brought from the Angren ceramic plant was subjected to derivatographical researches. The hinge plate of test made 10-12 mg. In fig. 1 four curves are visible.

1. T – measurement of temperature;
2. TW – are changes of weight;
3. STW – the speed of change of weight;
4. STH – are changes of content of heat.

Thermographic researches of skilled masses allowed to establish temperature intervals exothermic and endothermic effects, the speed of processes of agglomeration and the nature of its course in time. On a differential curve of the studied sample there are two endothermic and two exothermic peaks. The first endothermic effect corresponds to removal of hygroscopic moisture (110°C). The second in the field of temperatures 460-680°C is caused by kaolin dehydration with the subsequent formation of metakaolinite. In the range of temperatures 820-850°C absolutely insignificant peaks which can be carried to possible disintegration of kaolinite on oxides of aluminum and silicon are formed.

It is known that many fillers including a kaolin, allow to reduce a consumption of binding materials and to reduce the price of plastic, and at the same time can the mechanical durability and some dielectric characteristics of composites will increase [1]. It is known also since the beginning 70 in years the

scientific concept according to which fillers, usually mechanically mixing up with other components, do not enter with them chemical interaction. In this work with the help of structural researches as spectroscopic ways VS, IR and EPR of the composites of polystyrene filled with a kaolin will be shown:

- First, contrary to the eliminated representations formation of a chemical bond between components of composites in their interphase layers;
- Secondly, the new magnetic properties shown by these composites will be analysed.

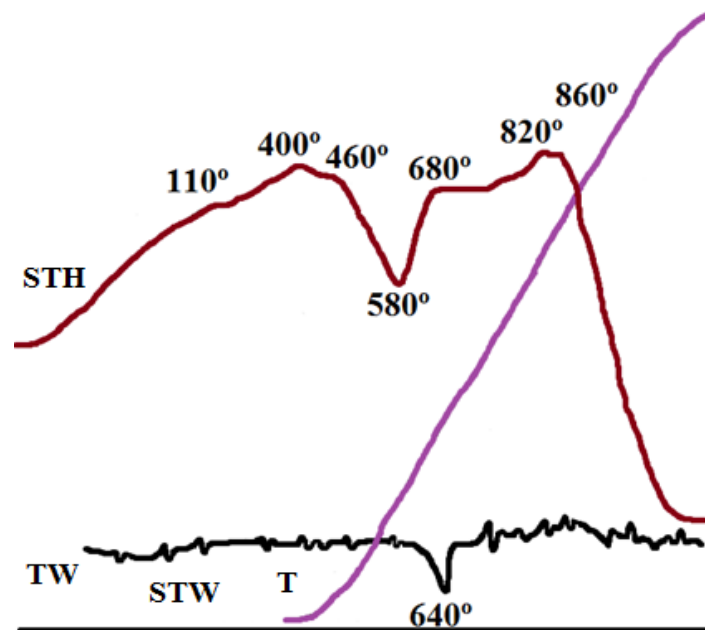


Fig. 1. The thermogram of kaolinite from the Angren ceramic plant

The last circumstance is very important fact as the modern magneto equipment needs new nonconventional materials with the operated properties.

The fact about a possibility of acquisition as be magnetism in polystyrene films after filling a kaolin is not surprising. The matter is that at the kaolin which is aluminum silicate there are always impurity having in more or smaller degree magnetism, for example, iron oxide, silicates of calcium and magnesium, etc. Another was important whether it is possible varying to operate purposefully technology of preparation of composites a magnetic condition of the prepared materials for us. In our specific case as a dispergation of parts of a kaolin in the binding environment of polystyrene it is chosen – an ultrasonic dispergation during certain time in polymer solution in benzene with the subsequent hot pressing of the mixed components.

References / Список литературы

1. *Gull V.E. etc.* "Electro conductive polymeric materials". M. Chemistry, 1968.
Pp. 241.