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THERMOGRAVIMETRIC EVALUATION OF THE RAW MATERIAL FOR THE MICACEOUS PAPER PRODUCTION

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ABSTRACT

The DTA, TG and dilatation methods were used to evaluate micaceous waste of muscovite type. That is a raw material for the production of the micaceous paper which is used as an electric insulation.

INTRODUCTION

The first operation at the paper production is a partial dehydroxylation of the mica. The course of this process has a great influence on the final quality of the micaceous paper /1/. Thermografic methods are convenient to investigate the course of the dehydroxylation /2,3/. These methods make possible to determine the initial temperature, the maximum rate and the final temperature of the dehydroxylation. Both conditions of the sample preparation and the experimental arrangement have a great influence on the parameters named above.

MEASURING METHODS

The dilatometer with a silica measuring part was used to observe the dilatation of the micas; the rate of the temperature rise was 7K/min. The DTA and TG curves were measured with the device derivatograph at the heating rate 10K/min.

RESULTS AND DISCUSSION

Fine various muscovite micas of Indian origin were studied. An example of mica dilatation curves is shown in the Fig.1. Experimental data are compared in the Tab.1. It is obvious, that the character of dilatation curves are more influenced by the dressing process of mica samples for dilatation measurements than by the differences between samples from various geographical deposits. The similar result was determinated from the DTA and TG curves, see Fig.2 and Fig.3, respectively. It is obvious, that the

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size of mica particles has the most important role in the course of the dehydroxylation.

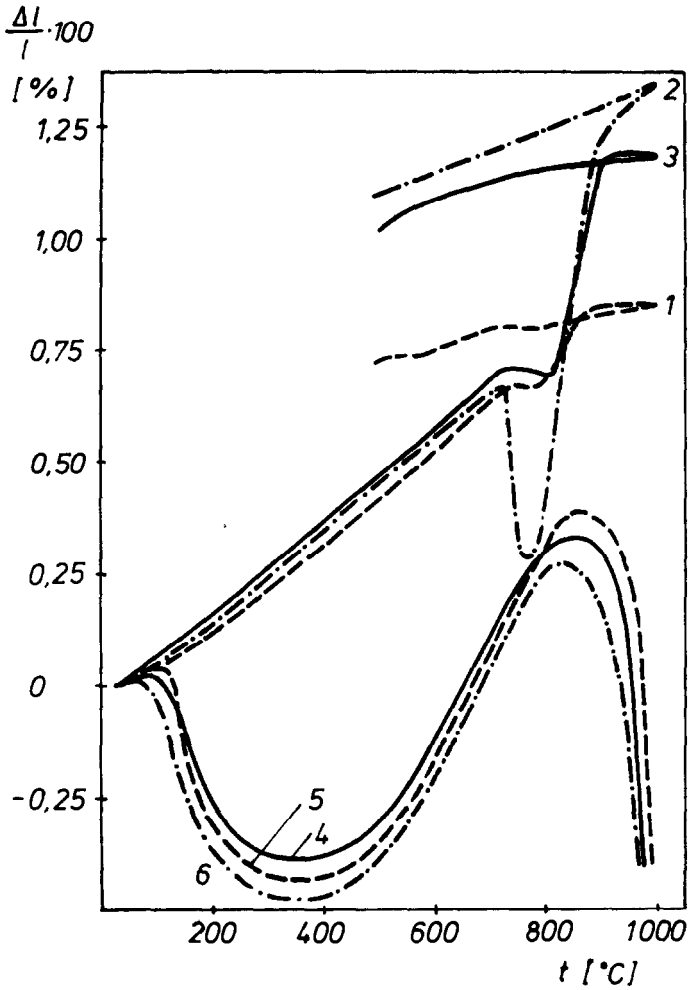

Fig.1
The reproducibility of the dilatation curves of the sample mica GS. The curves 1-3 are from the lump samples; curves 4-6 are garned from the 0,2 mm crushed mica particles pressed under pressure 15.10^5Pa.

CONCLUSIONS

The dressing of the mica samples to the thermografic measurements was found to be more important to determine the characteristic dehydroxylation temperatures than the differences between samples from various geographical deposits. If the thermografic methods are to be made full use of in practise to determine the course of the mica waste dehydroxylation for the purpose of

the mica paper production, it is necessary to implement the measuring on a mica sample. This sample has to be identical to an average sample for the production without any farther dressing in a laboratory. The thermogravimetric method is the best one for the material evaluation from this point of view.

Tab.1 Characteristic parameters fixed from the dilatation curves

Sample Designation	Interval of the linear part $\frac{\Delta t}{^{o}C}$	Coefficient of the Temperature Dilatation $\alpha \cdot 10^{6}/K^{-1}$	Temperature of the dehydroxylation		
			initial $t_1/^{o}C$	final $t_2/^{o}C$	inflexion point $t_3/^{o}C$
GS	50-735	9,6	738	943	837
Scrap 101	250-600	7,0	760	900	820
Scrap NC 21/75	42-600	8,4	755	900	840
Daruka	130-660	8,6	680	950	855
Scrap 911	80-650	10,3	675	900	-

of the samples which were cut from mica plates.

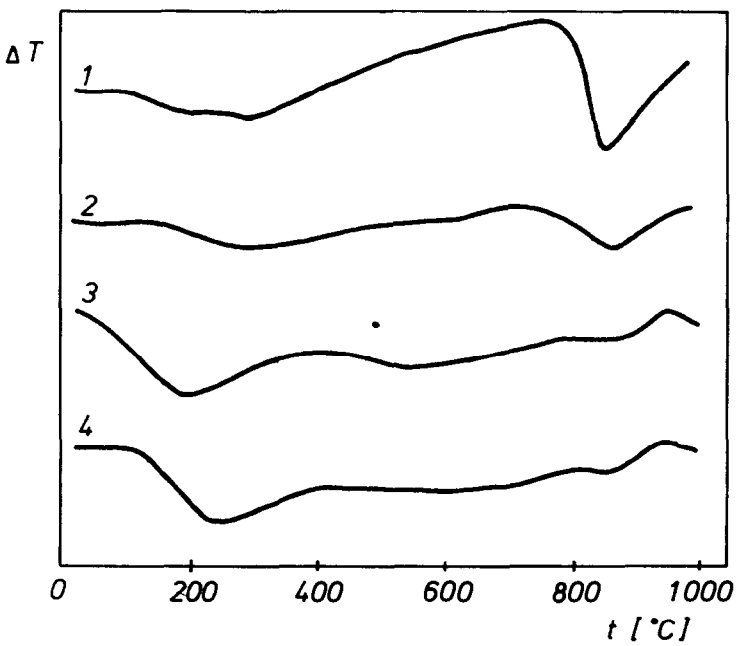

Fig.2

Fig.2. The DTA curves of the sample mica GS after various dressing. The curve 1 - mica in the form of greater plates; the curve 2 - mica cut and screened at the size under 2,8 mm; the curve 3 - mica cut and screened at the size under 0,2 mm; the curve 4 - the same as 3 after 30 hours drying at 105°C.

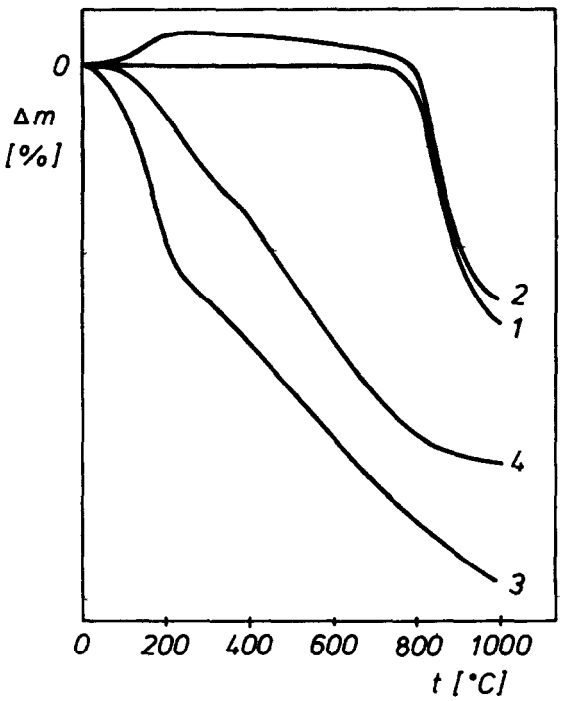

Fig.3
The TG curves of the sample mica GS after various dressing. The curves correspond to the samples named in Fig.2

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