

UNITED STATES PATENT OFFICE.

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TO RALPH MODJESKI, OF CHICAGO, ILLINOIS.

METHOD OF MAKING ARTIFICIAL MICAS.

No. 885,934.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FLORENTINE J. MACHALSKE, a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Method of Making Artificial Micæ, of which the following is a specification.

This invention relates to the production of materials having most or all of the physical, chemical and mineralogical characteristics of the several minerals commonly referred to as the Mica Group or Division, and hence referred to herein as artificial micæ; and the object of the invention is to provide a method of making artificial micæ in a form applicable for use in the arts.

I have discovered that by smelting a suitable charge in an electric furnace, preferably under conditions avoiding the contamination of the product or the reduction of the constituents of the charge by contact with carbon, I am able to obtain products having the valuable characteristics of the several native micæ, but superior to these in certain respects. The artificial micæ may be produced free from iron as their constitution is under the control of the operator; and they are found to possess a higher electrical resistance than the natural product.

By a proper choice of the ingredients and proportions of the charge the constitution and character of the mica may be varied as desired, and in general compounds may be produced having the essential characteristics of the several native micæ. The invention will be described by reference to particular examples thereof, it being understood however that the invention is not restricted to the specific charge ingredients stated or to the proportions named.

In carrying out the method I may employ an electric furnace of the induction type, whose secondary consists of a metal which is not injurious to the product, and preferably of a metal entering into the composition of the product, appropriate metals for the secondary being aluminum, magnesium, silicon, or in case an iron-mica is to be prepared, iron. Continuous metallic secondaries may be employed, the charge being modi-

fied to compensate for the metal passing into the product; or the metal may be incorporated with a properly proportioned charge to give it a proper conductivity.

Instead of using an induction furnace as described I may employ an electric furnace of any usual type having electrodes of a metal which is not injurious to the product, silicon being preferably employed.

In either case conditions are provided under which the product can absorb the necessary water of crystallization. This result may be secured by the following manipulation: All materials entering into the composition of the product with the exception of the caustic alkalies are smelted together, and to the molten mass the caustic alkalies (KOH or NaOH) are then added and fully incorporated or dissolved. The molten mass is then preferably discharged from the furnace and is permitted to cool slowly in an atmosphere charged with moisture. The water entering into the constitution of the product is derived from the alkali metal hydrate and from the moisture of the atmosphere. Other methods of incorporating the necessary water may be adopted.

Example 1. By melting in an electric furnace of the induction type a mixture containing 45.5 parts of pure sea-sand, 12 parts of bauxite, and 30.5 parts of burned magnesia, adding to the fully melted charge 14 parts of 90% caustic potash, and cooling in presence of a sufficient proportion of water vapor, a mica having the following composition is produced:

SiO ₂	44.2
Al ₂ O ₃	10.8
MgO	29.4
K ₂ O	9.9
H ₂ O (by difference)	5.7

100.0

Suitable current conditions are 1500 to 3000 amperes at 60 to 30 volts.

Example 2. By melting in an electric furnace provided with silicon electrodes a mixture containing 46.5 parts of pure white sand, 40 parts bauxite and 16.5 parts of 90% caustic potash, a suitable proportion of moisture

being absorbed, a mica is obtained having the composition:

5	SiO ₂	45.2
	Al ₂ O ₃	38.5
	K ₂ O	11.8
	H ₂ O (by difference) ..	4.5
		100.0

10 The current conditions may be as in Example 1.

I claim:

1. The method of making artificial micas which consists in melting in an electric furnace a charge proportioned to yield a mica.

2. The method of making artificial micas which consists in melting in an electric furnace and out of contact with carbon surfaces, a charge proportioned to yield a mica.

20 3. The method of making artificial micas which consists in melting in an electric fur-

nace in presence of metallic silicon serving as an electrical conductor, a charge proportioned to yield a mica.

4. The method of making artificial micas which consists in melting a suitable charge containing the non-alkali ingredients of a mica, incorporating an alkali-metal hydroxid with the melted mass, and permitting the product to cool.

5. The method of making artificial micas which consists in melting a suitable charge containing the non-alkali ingredients of a mica, incorporating an alkali-metal hydroxid with the melted mass, and permitting the product to cool in presence of moisture.

In testimony whereof, I affix my signature in presence of two witnesses.

FLORENTINE J. MACHALSKE.

Witnesses:

EDW. RICHARDS,

OTTO E. BEHRENSMEYER.