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*for a sustainable future*

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BASALT ROCKS

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## Volcanic Rocks

Volcanic rocks basaltic and andesitic are common in Norway as in most. They were erected from the magma as granite, syenite, gabbro, and other igneous rocks, alkali syenite, basaltic and andesitic. The group of basaltic rocks is large and includes rocks possessing considerably different compositions. All of them contain magnesia and lime.

/P. K. K.

Petrographic classification of basalts is based on the content of further minerals as olivine, plagioclase, feldspatoids (nepheline and leucite) and quartz.

Basalts are classified in general also according to:

- a) geological age
- b) content of olivine
- c) content of feldspars

All these sorts are also divided according to their content in acidic, intermediate and basic basaltic.

c) according to color and basalts are subdivided in two groups:

- dark-colored basalts, i. e. basalts containing more calcic lime to iron-calcium.
- gray-colored basalts, i. e. tertiary and lower tertiary basalts

b) Basalts - the alkali basalts

- alkali basalts
- alkali basalts

c) Basalts - the alkali basalts

- alkali basalts (basalts, nephelinites, leucites, nephelinites)
- alkali basalts (alkaline basalts, nephelinites)
- alkali basalts (leucites, nephelinites, also with rocks)

and c) Basalts - the alkali basalts

Basalts of this type are distinguished by their composition. They are characterized by high alkali content, volcanic activity and high temperature. Subsequent volcanic activity, and particularly of occurrences are characterized by high beds, however, also by high temperatures, dikes and stocks.

*[Handwritten signature]*

Basalts of this type may be distinguished from the other basalts by...

- acid basaltic with  $SiO_2$  content about 46%
- intermediate basaltic with  $SiO_2$  content 48 - 50%
- basic basaltic with  $SiO_2$  content 51 - 52%

Acidic and intermediate paleovolcanic rocks are not used as they are applied practically only for the same purposes as the crushed aggregate as possessing more than the required properties for this purpose and being easy to obtain.

Basic paleovolcanic basaltic and andesitic rocks, gabbros, spilites, diabases and melaphyres. In general, they are not used for crushed aggregate as well. The only kind of basaltic rock used at KOTOROV near INAM should be noted (see also the note at the end of the study).

### Paleovolcanic basaltic

These are the basaltic proper. In order to determine their content (Mg, Fe)  $SiO_2$  they are subdivided into the following large groups:

- 1) Basaltic rocks with high iron content  
represented by the following mineral groups:
  - Olivine melilitite
  - Olivine nephelinitite
  - melilitite
  - Ilmenite
  - nepheline basaltite

- leucite-basalt
- olivine leucite
- olivine basalt

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2) Leucite-bearing Basalts

represented by these rocks:

- common basalt
- leucite
- leucite-olivine
- nepheline-olivine
- augite
- nepheline

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Summary of chemical composition of rocks

|                                | basaltic | olivine | leucite |
|--------------------------------|----------|---------|---------|
| SiO <sub>2</sub>               | 44.34    | 45.01   | 45.01   |
| TiO <sub>2</sub>               | 1.55     | 1.55    | 1.55    |
| Al <sub>2</sub> O <sub>3</sub> | 15.55    | 15.55   | 15.55   |
| FeO                            | 4.51     | 4.51    | 4.51    |
| MgO                            | 9.55     | 9.55    | 9.55    |
| CaO                            | 1.55     | 1.55    | 1.55    |
| Na <sub>2</sub> O              | 7.51     | 7.51    | 7.51    |
| K <sub>2</sub> O               | 5.55     | 5.55    | 5.55    |
| P <sub>2</sub> O <sub>5</sub>  | 3.55     | 3.55    | 3.55    |
| H <sub>2</sub> O               | 1.55     | 1.55    | 1.55    |
| Total                          | 6.55     | 6.55    | 6.55    |

is total from 161 samples.

Occurrences of ...

ČSSR: Clayite ...: ...  
Kamenec near Kamenice, Kamenec, ...

Nonrepublican ...: ...  
Kamenice near ...

Europe ...: ...  
Kotava (Kamenice ...), ...  
like topirite), ...

Clayite ...: ...  
Kamenec, ...  
Kamenec, ...

Clayite-... ..: ...  
Kamenec, ...  
Kamenec, ...

Developing ...

- Syria, ...
- India, ...
- Japan, ...
- China, ...
- USA, ...
- USSR, ...
- France, ...
- Germany, ...
- Italy, ...
- Spain, ...
- Portugal, ...

Capitalistic countries:

- 1) GERMANY (Prussia, Saxony, Württemberg)
- 2) France (Lorraine)
- 3) England (Ireland, Wales, Scotland)
- 4) U.S.A. (Oregon, New Jersey)

Socialist countries:

- 1) GERM (Upper-Saxony - Brandenburg)
- 2) Poland (Dolny Slask, Lublinska, Wloclawskie)
- 3) U.S.S.R. (Sverdlovsk, Altai, Khabarovsk)

U.S.S.R. - 1928

- 1) Industrial Revolution
- 2) Manufacture of products from Russia
- 3) New industrial for Russia
- 4) New industrial for Russia

U.S.S.R. - 1929

The first five-year plan for the U.S.S.R. was adopted in 1928. It was the first time that a country had set a plan for its economic development. The plan was based on the idea of industrialization and the development of heavy industry. The plan was divided into two main parts: the first part was for the development of heavy industry and the second part was for the development of light industry and agriculture. The plan was a success and it led to the rapid industrialization of the U.S.S.R. in the 1930s.



ANALYSIS OF THE PRODUCTION OF BLENDED PORTLAND CEMENT

The application of natural basalt in the production of cement is a process which is being carried out in various countries where precise shapes of stone are not required. In the stone is worked very carefully, pieces of the stone are broken off leaving small shaped objects.

The new method of applying by casting is a process which is made it possible to produce relatively large quantities of material similar to cast iron products. Produced in a form similar to that of the basalt casting method took a long time to produce. The difficulties connected with the right shape of the stone, the crystallization and cooling, had to be considered.

*Dr. A. A. A. A.*

It was necessary to investigate the possibility of using basalt for the casting process. It has been found that from the petrographic point of view the ordinary basalt and basaltites are the most satisfactory. In the case of any fluctuate within these limits:

|                                |      |   |      |
|--------------------------------|------|---|------|
| SiO <sub>2</sub>               | 43.5 | - | 47.0 |
| Al <sub>2</sub> O <sub>3</sub> | 2.0  | - | 3.5  |
| Fe <sub>2</sub> O <sub>3</sub> | 11.0 | - | 13.0 |
| CaO                            | 4.0  | - | 7.0  |
| MgO                            | 5.0  | - | 6.0  |
| Na <sub>2</sub> O              | 0.2  | - | 0.3  |
| K <sub>2</sub> O               | 0.0  | - | 11.0 |
| Sum                            | 10.0 | - | 11.0 |
| SiO <sub>2</sub>               | 2.0  | - | 3.5  |
| Al <sub>2</sub> O <sub>3</sub> | 1.0  | - | 2.0  |

*Prof. Dr. A. A. A.*

DESIGN RECOMMENDATIONS FOR THE DESIGN OF A TUNGSTEN CARBIDE

1. It must be homogeneous, low porosity in form of tungsten carbide, is must be uniform in the grain size. It must not contain compounds of other elements as more basic or acidic characterisation of tungsten carbide segregates. Very detrimental as tungsten carbide is not a particularly strong oxidizing alloying element, especially oxygen is present which cannot be fused during melting process.

2. The raw material must not be compacted or sintered. Sintering of crystals less than the melting point will deteriorate the homogeneity.

3. Especially dangerous to the contaminants are iron, oxygen, and nitrogen, the mixing cannot be carried out in chamber glass.

The fused benefit can be successfully achieved when it is exposed to friction, vibration or impact by hand and sharp particles of various materials. Similar products have long time since, they are used in industry and even the strongest solids can be broken to not attract them. They possess the following properties:

- 1. Compressive strength: 4000 - 5000 kg/cm<sup>2</sup>
- 2. Hardness: 9 - 10 on Mohs scale
- 3. Tensile strength: 250 - 300 kg/cm<sup>2</sup>
- 4. Bending strength: 400 - 500 kg/cm<sup>2</sup>
- 5. Resistance to abrasion: 0.05 - 0.07 mm<sup>3</sup>/cm<sup>2</sup>

*Respectfully,  
W. W. ...*

The following problems are encountered in the  
above cases: well sites, tubes, casing, etc. in  
acid settings, casing or perforation, and  
bodies of pumps, barrel spindles, very high speed  
insulators, etc.

/s/ J. H. H. H.

Methods of manufacturing the glass materials

The substitution of cheap and well known  
raw materials to expensive ones in glass has long  
been an important economic consideration. In  
all ordinary cases containing lime, soda, etc.  
of alkalis and fluxes, the quantity of raw materials  
applied in glass making is limited to a certain  
the content of lime and soda, and the quantity  
more it is not determined or there is no  
as in the manufacture of glass or iron glass.

Methods of manufacturing the glass materials

The manufacture of bottle glass without  
insulation against air temperature glass  
by glass wool. In this way the insulation  
long fibers collected into a soft, porous,  
bodies of bottles are suitable for the

wool, also that it is a very fine fibre with a  
high content of carbonic acid. It is  
to be said that the wool is not  
with a higher oil content, especially in  
as regards, are those of the wool  
oil content. It is said to the  
basic lamellae in which the fatty acids are  
fatty acids are soluble. The wool  
lamellae is supported by the lamellae  
and the lamellae are the lamellae  
and the lamellae are the lamellae  
lamellae wool is also important for the  
lamellae. The lamellae are  
lamellae that contain oil. The lamellae  
and oil is important for the  
lamellae the oil of the wool. In the case  
lamellae for the lamellae and oil is  
as the lamellae of the wool is  
oil.

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