



Fig. 7. Shocked powder of SiO<sub>2</sub> and KAlSi<sub>3</sub>O<sub>8</sub> with zones of variable density.

the partial destruction of the lattice. The small quantity of the very dense glass (N = 1.536, constant density) was found in zone 2. This glass contained the needle-shaped grains which were hardly observed in the microscope, with these grain being possibly a coesite or stishovite (stishovite). The stishovite was found in SiO<sub>2</sub> after shock compression after treatment by a solution of HF and HNO<sub>3</sub> (DERIBAS *et al.*, 1967; DE CARLI and MILTON, 1965) and the coesite was found in some of our previous experiments (DERIBAS *et al.*, 1966). In the present experiments with large explosive charges (fig. 7) some coesite, tridimite (hexagonal) (coesite ≥ tridimite) and sometimes (in experiments with initial glass of SiO<sub>2</sub>) neogenic quartz were found in zones 1, 2, 3. Some tridimite, traces of coesite and sometimes (in experiments with initial glass of SiO<sub>2</sub>) α-cristobalite were found in zones 4-5. We suppose that the formation of tridimite and cristobalite is connected with the high residual temperature after shock compression. Zones 2 and 3 moved along the detonation and their sizes increased with explosive charge. Zones 1 and 2 disappeared with the largest explosive charges. Simultaneously, the appearance of stishovite instead of coesite is possible.

According to this phenomenon, we considered in the previous paper (DERIBAS *et al.*, 1966) three different regimes of stability of quartz, coesite and stishovite according to the weight of explosive charge. The present investigation shows that the detection of different zones in one experiment is more correct. It is necessary to note that the appearance of coesite instead of stishovite depends on many factors little understood at present.

### 3.2. KAlSi<sub>3</sub>O<sub>8</sub>

The behaviour of KAlSi<sub>3</sub>O<sub>8</sub> in shock experiments (fig. 7) is similar to that of SiO<sub>2</sub> in general. The glass-like phase (gl<sup>1</sup>) appeared in zones 2 and 3 with higher variable density (N up to 1.505). The relics of potassic feldspar with strongly destroyed lattice were observed. The presence of leucite and the variations of composition of glass were not found. The comparison of these data with the phase-diagram of a system K<sub>2</sub>O-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> (SCHAIRER and BOWEN, 1955) shows that these effects are not simple melting at high temperature. The new high-pressure phase of KAlSi<sub>3</sub>O<sub>8</sub> recently discovered (RINGWOOD *et al.*, 1967) was not found definitely. Probably a very small quantity of this phase was formed in our experiments.

### 3.3. Oth

A similar framework determined KAlSi<sub>3</sub>O<sub>8</sub> in shock (1963) coesite with pre cleavage,

### 4. Discuss

It is possible formation zone" coesite type II silicates two sub decomposed essentially but in fact never be

Type

I

IIa

IIb

III

\* Destroy