Supplementary materials

DSC/TG data.

Fig.3.

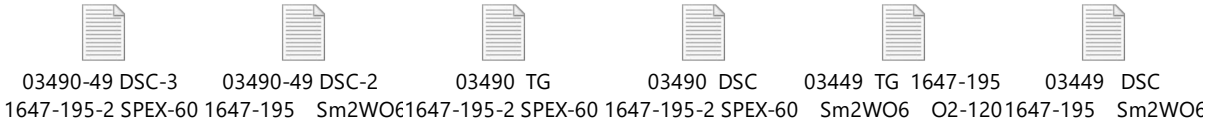
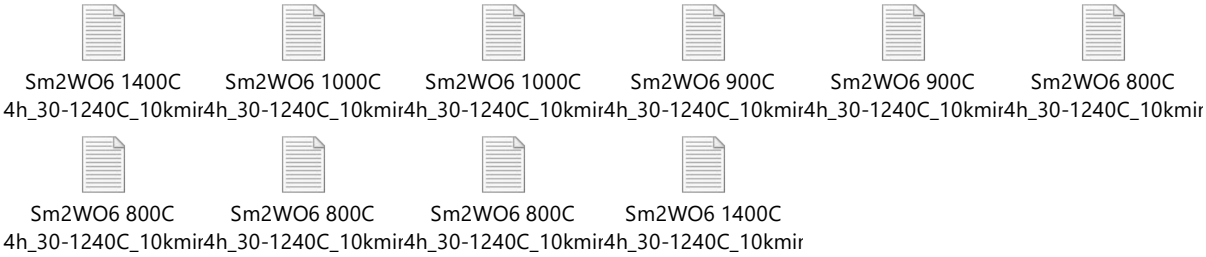


Fig.9



XRD data.

Fig. 1

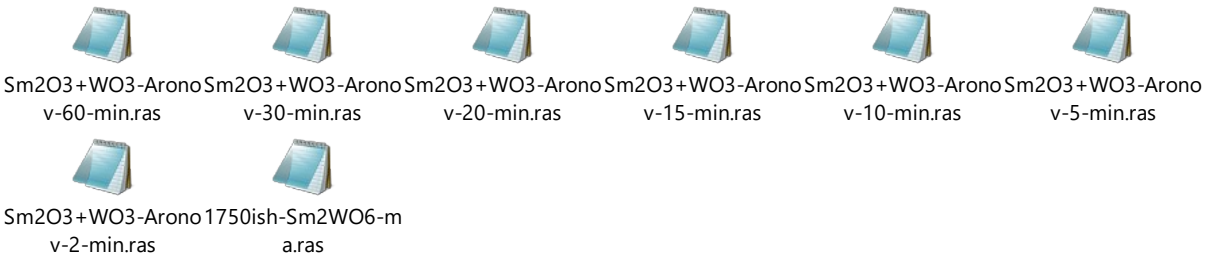


Fig.4a

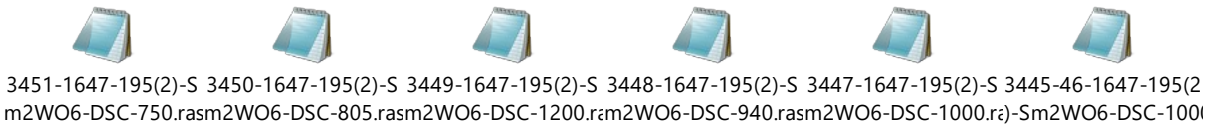
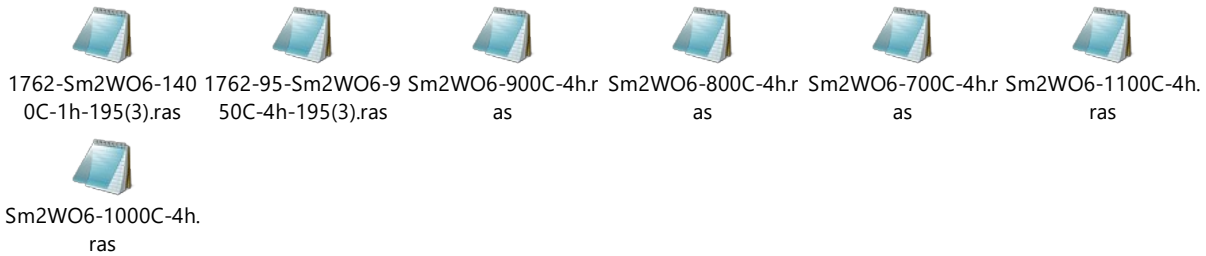


Fig. 5.



Raman data

195 Sm2WO6 SPEX 60min_1.dpt

195 Sm2WO6 SPEX 60min.dpt

Sm2WO6 1500C 1hrs.dpt

Sm2WO6 1400C 1hrs.dpt

Sm2WO6 1000C 4hrs.dpt

Sm2WO6 1000C 4hrs.0

Sm2WO6 950C 4hrs.dpt

Sm2WO6 900C 4hrs.dpt

Sm2WO6 800C 4hrs.dpt

Sm2WO6 700C 4hrs_1.dpt

1762-9 Sm2WO6 900C 4hrs.dpt

195(2) Sm2WO6 Aronov_1.dpt

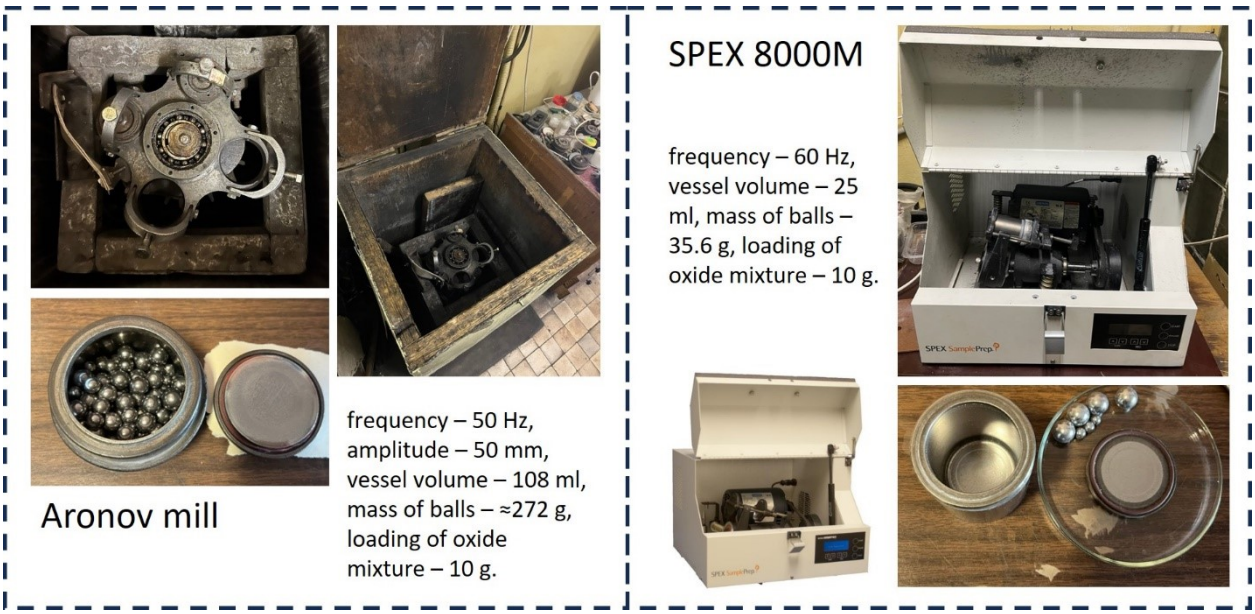


Fig. S1. Photographs of mills, vessels and balls used for mechanical activation of powders.

One of the methods used to compare the energy intensity of mills of different designs is to compare the rate of increase in the specific surface area of the test object. It is known that in the early stages of graphite milling, the specific surface area increases linearly with milling time. Thus, by comparing the rate of increase of the graphite surface in different mills, it is possible to estimate the ratio of their specific powers.

In this case, to compare the specific powers of the SPEX 8000M mill and the Aronov mill, we took 10 g of artificial graphite with an initial surface area of 2 m^2/g and ground it for 5 min in an argon atmosphere in both mills. The specific surface area of the ground graphite was then determined using the low temperature argon adsorption method. The specific surface area of graphite after 5 minutes milling in the Aronov mill was 170 m^2/g and after 5 minutes milling in the SPEX 8000M – 12.5 m^2/g. It can be assumed that the Aronov mill is 13.6 times more powerful than the SPEX 8000M for a given load of balls and powder.

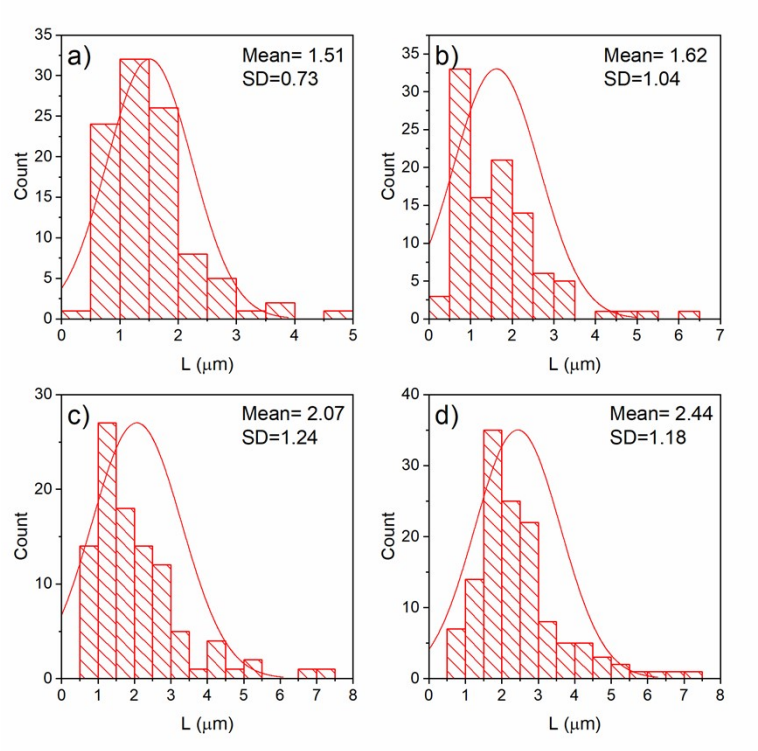


Fig. S2 Crystal size distribution of the Sm_2WO_6 sintered at (a) 800 °C, (b) 900 °C, (c) 950 °C for 4 h and (d) 1400 °C for 1h.

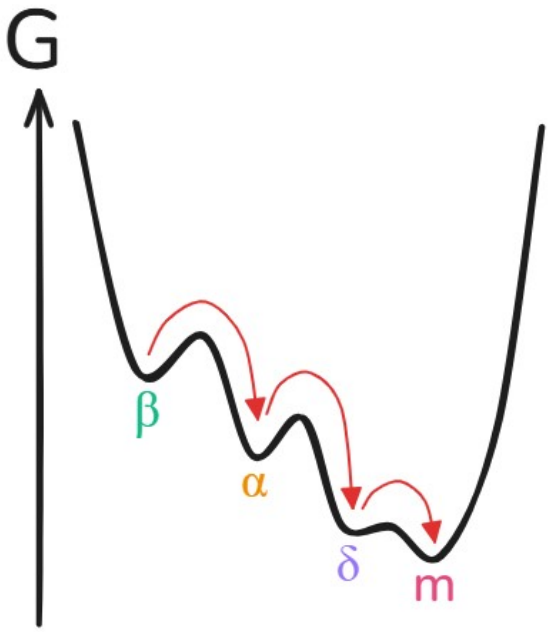


Fig. S3 Schematic dependence of the total energy on the reaction coordinate.