

Technological laboratory

RNDr. M. Mihalik, PhD, Institute of Experimental Physics SAS, mihalik@saske.sk

Optical Floating Zone Furnace FZ-T-4000:

The optical furnace is intended for the preparation of single crystals by the method of floating zone melting. The device allows the preparation of crystals of various kinds of materials from metals to the insulators. Optical furnace is equipped with four elliptical mirrors powered with halogen lamps as the heat source. The maximal temperature reached by the melting zone has the value 2220°C; operating temperature is 1580°C. Melting zone is monitored by a CCD camera and the image is displayed on the monitor. The device includes programmable equipment which regulates the input power of halogen lamps. The system has a flow meter and a device for obtaining a desired vacuum – turbo-molecular pump. Technological laboratory is equipped with supporting facilities for the preparation of starting materials for optical furnace, including the methods of powder metallurgy and arc melting.

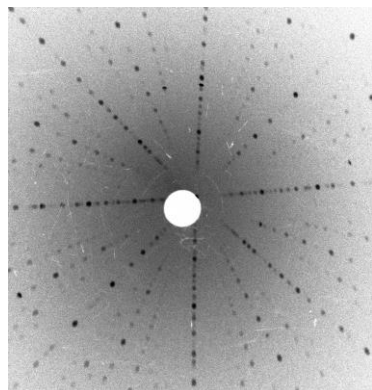


Technical specification

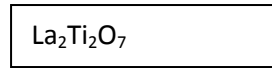
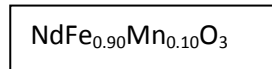
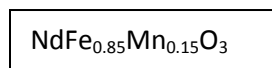
- | | |
|--|-----------------|
| • The maximum operating temperature; | 2200°C |
| • Ambient operating temperature | 1580°C |
| • The maximum crystal length | 1500mm |
| • The feed rate of mirrors for growth of the crystal | 0,01 ~ 300 mm/h |
| • The feed rate of the shaft | 0,01 ~ 300 mm/h |
| • The speed of rotation of the shaft | 5 ~ 100 rpm |
| • The number of halogen lamps | 4 |
| • The outer diameter of quartz tube | 50 mm |
| • Maximum pressure in the tube | 0,95 MPa |

Applications:

- Preparation of single crystals, for example: NdMnO₃, NdFeO₃, GdMnO₃, TbMnO₃, TbFeO₃...



Laue patterns of GdMnO₃ single crystal.



Examples of prepared materials.