

2.14. An internal rotating target for the cyclotron

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The technical description of an internal rotating target for the 16-MeV cyclotron of the »Ruder Bošković« Institute is given. The target has been designed in such a way that its bearing housing is mounted on a plate-shaped cover, similarly as in stationary targets.

The holder of the target is a brass tube of an outer diameter of 25 mm. The target is shaped like a hollow disk and is placed at one end of the holder. The middle part of the holder passes through the housing and rotates together with it. The end of the target holder passes through a double cooling chamber. Cooling water is supplied to the target by an inner tube and is sent back through the body of the holder itself. Rotational motion is transmitted to the target from an electromotor by two pairs of gears, the speed of rotation being approximately 80 rotations per minute.

The rotating target is in principle made of the material to be bombarded. Another possible way of making the target is to pour the metal to be bombarded into a hollow in the standard copper target.

The rotating target has the advantage of permitting bombardment of material with a low melting point, applying currents that are higher by a factor of 2–3 than in the case of stationary targets.

Measurements of the beam current impinging on the rotating target can be performed by calorimetric and electric methods. Measurements by the former method are performed in a similar manner as in stationary targets, i. e., by reading out the differences in temperature of the cooling water at the outlet and the inlet.

To perform measurements by the latter method, the target should be grounded by a low-pass filter (to eliminate high frequencies at the target) and by a terminal resistor. The electric voltage obtained across this resistor by the ionic beam current is fed to a recorder which gives an indication corresponding to the beam intensity.