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## Production of highly charged ions in the range of energy of $10 \text{ V} \times q$ up to MeV

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### Abstract

A new ion irradiation facility for the formation of beams of highly charged ions in a wide range of kinetic energy from about  $10 \text{ V} \times q$  up to MeV is presented. The ions are produced in sources of the Dresden EBIT type which allow the production of a wide spectrum of highly charged ions such as  $\text{C}^{6+}$ ,  $\text{Ar}^{18+}$ ,  $\text{Ni}^{28+}$ ,  $\text{Kr}^{35+}$  and  $\text{Xe}^{44+}$ , respectively. The integral ion output of these ion sources is in the order of some  $\mu\text{A}$  per pulse at pulse widths of  $2 \mu\text{s}$  up to about  $10 \mu\text{s}$ . For individual ion charge states ion currents of up to about  $100 \text{ nA}$  per pulse can be obtained. In DC extraction mode (leaky mode) ion currents in the order of hundreds of pA are detected. An advanced Dresden EBIT type source, the Dresden EBIS-A, is employed at an irradiation facility. The target chamber comprises a sample manipulation and transfer system as well as numerous preparation and diagnostic tools. The facility will provide an experimental environment for basic research in atomic and solid state physics as well as for applied technology in areas such as surface engineering, surface analysis, nanostructuring and nanobiotechnology.

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