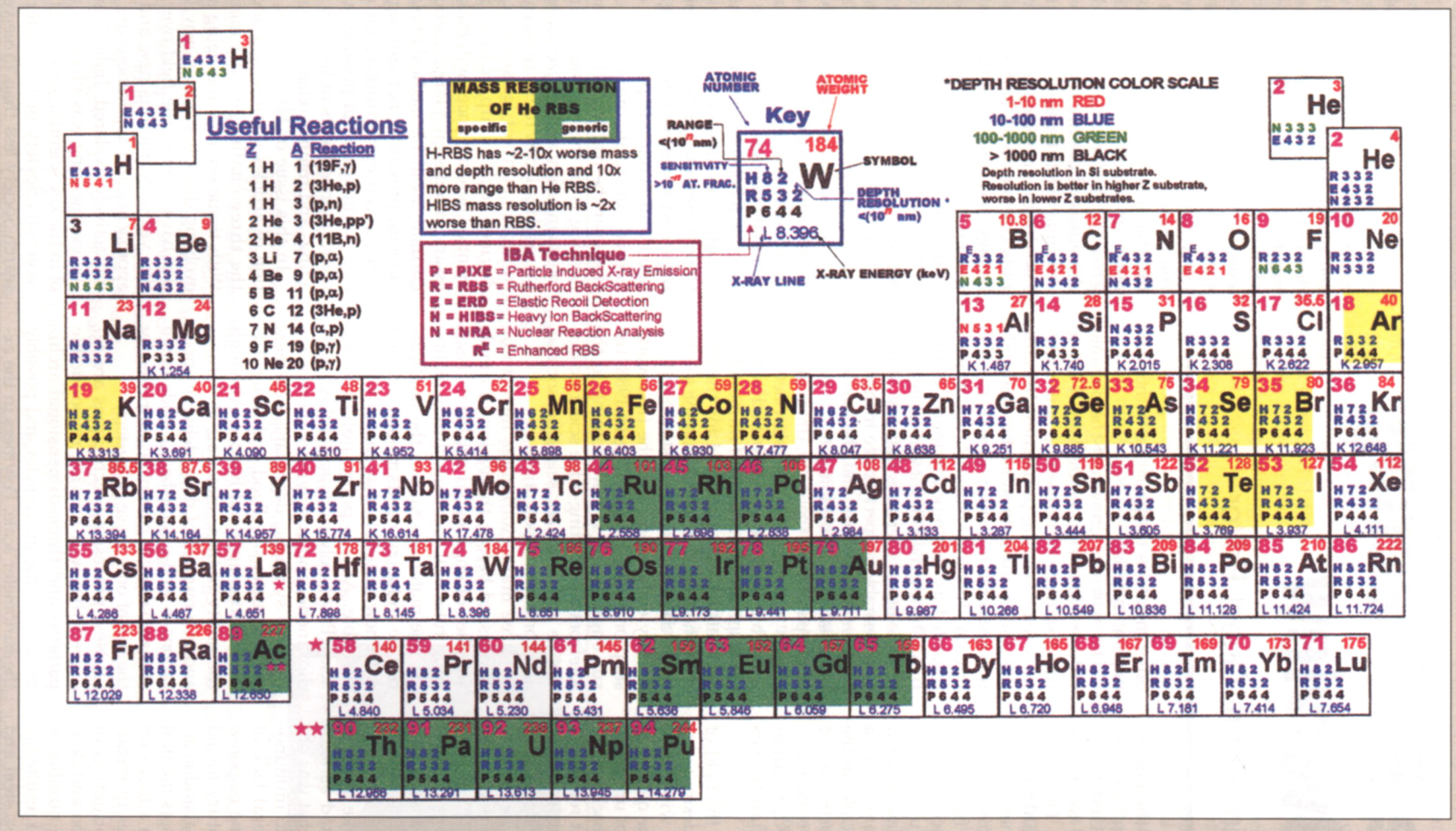
Ion Beam Periodic Table



The table shows order of magnitude estimates of typical sensitivities, analysis ranges, and depth resolutions obtained with normal ion beam analysis (IBA) techniques in silicon substrate samples. See key for details. The *generic* mass resolution of RBS worsens with increasing atomic number Z. Yellow background shading indicates approximate mass resolution per row of the periodic table. Note that certain elemental pairs can never be resolved with He RBS. These are identified by green shading (termed *specific* mass resolution in key). Depth resolution is better in higher Z substrates, worse in lower Z substrates. The inverse is true for range. Time-of-flight techniques generally have ~10× better depth resolution but 10× worse sensitivity. *Ex vacuo* and micro-IBA (< 2-μm diameter beam spots) are also 10× less sensitive. *Ex vacuo* techniques also exhibit inferior depth resolution. For more information about IBA, or the Sandia National Laboratories' Ion Beam Materials Research Lab, contact Dave Walsh via e-mail, dswalsh@sandia.gov or Barney Doyle, bldoyle@sandia. gov.

Facts & Figures presents graphs, nomographs, tables, charts, and frequently used information of the type compiled by materials researchers and often taped to the walls by their desks. These "cheat sheets" are intended to be not only interesting but useful enough to keep for reference. Please send your comments and any potential material for future publication to Alan Hurd, Sandia National Laboratories, Albuquerque, NM 87185-0609; e-mail ajhurd@sandia.gov.

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