CYCLOTRON TARGETS AND PRODUCTION TECHNOLOGIES USED FOR RADIOPHARMACEUTICALS

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This paper deals with some technical aspects of development and production of cyclotron-made radiopharmaceuticals (excluding PET). In this field, nuclear chemistry and pharmacy are in a close contact; therefore, requirements of the both should be taken into account.

The principles of cyclotron targetry, separation/recovery of materials and synthesis of active substances are given, as well as issues connected with formulation pharmaceutical forms of radioactive medical products. As the radiopharmaceuticals should fulfil the requirements on *in vivo* preparations, there exist a variety of demands pertaining to Good Manufacturing Practice (GMP) concept, which is also briefly discussed.

A typical production chain is presented involving the treatment of irradiated cyclotron target, choosing and validation of method for pharmacon synthesis, selection or development of necessary analytical procedures, preparing active substance according pharmaceutical standards, development of dosage form, adoption of final technology procedure and opening the clinical trial.

Practical examples of real technologies based on cyclotron-made radionuclides (^{81}Rb, ^{123}I, ^{68}Ge, ^{211}At) are given. Special attention is devoted to the technology of enriched cyclotron targets. Frequently used medicinal products employing some cyclotron-produced active substances are characterised (Rb/Kr or Ge/Ga generators, ^{123}I-labelled MIBG, OIH, MAB's and some others). The cyclotron produced radioactive implants for transluminal coronary angioplasty (radioactive stent) are introduced as an example of a medical device developed for therapeutic application.