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<<普通高等教育"十二五"规划教材>>

图书基本信息

书名：<<普通高等教育"十二五"规划教材>>

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内容概要

《普通高等教育"十二五"规划教材:核化工与核燃料工程基础》是根据核化工与核燃料工程专业英语教学大纲编写的，内容分为两大部分：第一部分为核化学与放射化学基础知识，其中包括7个单元；第二部分为核化学工程与工艺，其中包括6个单元。
13个单元的内容涉及核物理、核化学、放射化学、核燃料循环、核化工等。
《普通高等教育"十二五"规划教材:核化工与核燃料工程基础》供工科大学核化工与核燃料工程专业或相关专业三、四年级学生使用，也可供相关领域的科技人员使用。

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章节摘录

版权页： 插图： In the study of nuclear reactions, nuclear structure, and the heaviest elements, one frequently needs to chemically separate the nuclide（s） of interest from other radioactive species that are present.This is done by performing radiochemical separations that involve the conventional separation techniques of analytical chemistry adapted to the special needs of radiochemistry.For example, radiochemical purity is generally more important than chemical purity.When dealing with short—lived nuclides, speed may be more important than yield or purity.The high cost of radioactive waste disposal may require unusual waste minimization steps.As noted earlier, radiochenucal separations need not be quantitative.One only needs to know the yield.Because of the availability of modern high—resolution counting equipment, such as Ge γ—ray spectrometers, modern radiochemical separations frequently are designed only to reduce the level of radioactive impurities in the sample rather than producing a pure sample.The counting instrumentation is used to ""isolate"" the nuclide（s） of interest from other nuclides.Thus, modern procedures sometimes are similar to qualitative analysis schemes, breaking products into chemically similar groups and using instrumentation to further separate the group members.A recent review summarizes some newer developments of relevance to radiochemistry. 6.1 Precipitation The oldest, most well—established chenucal separation technique is precipitation.Because the amount of the radionuclide present may be very small, carriers are frequently used.The carrier is added in macroscopic quantities and ensures the radioactive species will be part of a kinetic and thermodynamic equilibrium system.Recovery of the carrier also serves as a measure of the yield of the separation.It is important that there is an isotopic exchange between the carrier and the radionuclide.There is the related phenomenon of co—precipitation wherein the radionuclide is incorporated into or adsorbed on the surface of a precipitate that does not involve an isotope of the radionuclide or isomorphously replaces one of the elements in the precipitate.Examples of this behavior are the sorption of radionuclides by Fe（OH）30r the coprecipitation of the actinides with LaF3, Separation by precipitation is largely restricted to laboratory procedures and apart from the bismuth phosphate process used in World War II to purify Pu, has little commercial application. As a practical matter, precipitation is usually carried out in hot, dilute aqueous solutions to allow the slow formation of large crystals.The pH of the solution is chosen to minimize colloid formation.After precipitation, the precipitate is washed carefully to remove impurities, dissolved, and reprecipitated to cause further purification.The precipitate is collected by filtration （Fig.6.1）.

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