

机械与动力工程学院博士生资格考试笔试大纲

Syllabus of Ph.D. Qualification Examination (SJTU-ME)

*笔试主题 Exam Topic	(中文) 核燃料循环
	(English) Nuclear Fuel Cycle
*考核形式 Exam Format	闭卷考试, 1 小时 Closed-book exam, 1 hour
*考核目标 Exam Target	掌握核燃料循环各环节的基本概念、原理、方法, 分析和解决在乏燃料后处理领域中核素的处理与处置等核化学工程问题。 Master the methods and principles of the nuclear fuel cycle and possess the ability to analyze and solve the nuclear chemical engineering problems in the field of spent fuel reprocessing.
*考核内容 Exam Contents	<p>1、核燃料循环 nuclear fuel cycle 核燃料循环方式、基本构成、开式与闭式循环 means and composition of nuclear fuel cycle, open and closed cycle</p> <p>2、铀资源提取及铀浓缩 Nuclear fuel resources and enrichment 铀矿开采与加工、铀的纯化与转化、铀浓缩的基本技术 mining and milling, purification, conversion, U enrichment</p> <p>3、燃料元件 fuel element 燃料元件基本结构与类型、核燃料、包壳材料 composition and type of fuel element, nuclear fuel, cladding material</p> <p>4、乏燃料后处理与再循环 Spent fuel reprocessing and recycle 核燃料后处理和再循环概念、后处理目的、乏燃料后处理技术、先进后处理、分离与嬗变 Concepts and purpose of spent fuel reprocessing and recycle, methods of reprocessing and its basic procedure, advanced spent fuel reprocessing, transportation of HLW.</p> <p>5、核废料处理与处置 The treatment and disposal of radioactive waste 中低放及高放废物的处理与处置技术、高放废液固化 management and disposal of HLW and LLW, solidification of HLLW.</p>
*参考书目 References	1、《最新核燃料循环》，上海交大出版社 2、国家和安全局业务培训丛书《核燃料循环》，核工业研究部
备注 Notes	