# 化工与化学学院

**学术学位硕士研究生培养方案**

# 学科代码：0703 学科名称：化学

1. **培养目标**

本学科面向世界科技前沿、面向经济主战场、面向国家重大需求、面向人民生命健康，立足航天、服务国防，培养具有家国情怀、社会责任感强、具有较强创新能力和国际化视野、基础理论扎实、专业知识系统、综合素质全面，注重理工结合与学科交叉，德智体美劳全面发展，能够独立地、创造性地从事化学领域的科学研究、教学、化学管理工作，引领化学和化学工程与技术行业未来发展的杰出人才。

1. **基本要求**

1）应具备的品德及基本素质要求

遵纪守法、正直守信、身心健康，坚守学术规范和学术道德规范；实事求是，治学严谨，具有献身化学科学事业的精神和良好的创新能力；掌握本学科坚实的基础理论和系统的专门知识，具有广阔的学科视野、丰富的想象力和多角度、批判性思维能力，具有独立从事科学研究或担负专门的技术工作的能力。

2）应掌握的基本知识及结构

掌握坚实的化学基础理论和系统的专业知识；掌握本学科先进的研究方法、合成与制备等实验操作技能；熟悉本学科及相关学科方向的发展历史、研究现状和发展动态；能熟练使用计算机，且较为熟练地掌握一门外语。

3）应具备的基本能力

具有通过课程学习、专业实践等方式获取研究所需知识和方法的能力，掌握自主获取新知识的能力；具有了解本学科发展方向和科学研究前沿的能力；具有从事科学研究工作的能力，有丰富的想象力和批判性思维能力，能深入分析问题和解决学术问题；具备应用所掌握实验技能、研究方法进行学术研究或技术开发的实践能力；具备良好的学术表达和学术交流能力。

1. **研究方向**

|  |  |  |
| --- | --- | --- |
| 1） 合成化学 | 2）表界面化学 | 3）功能纳米材料与器件 |
| 2） 计算化学 | 5）高分子化学 | 6） 生物分子科学 |

1. **培养年限**

硕士研究生基本培养年限为3年。

1. **课程体系设置**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 类别 | 课程编号 | 课程名称 | 学时课内/实验 | 学分 | 开课时间 | 备注 |
| 学位课程 | 公共学位课 | MX61001 | 新时代中国特色社会主义理论与实践 | 32 | 2 | 秋 | 必修 |
| MX61002 | 自然辩证法概论 | 16 | 1 |  | 必修 |
| FL62000 | 第一外国语（硕士） | 32 | 2 |  | 必修 |
| 学科核心课 | CC64175 | 学术规范及论文写作 | 16 | 1 | 春 | 必修 |
| CC64201 | 高等物理化学 | 32 | 2 | 秋 | 至少选3门 |
| CC64202 | 固体化学 | 32 | 2 | 春 |
| CC64203 | 物质结构分析 | 32 | 2 | 秋 |
| CC64204 | 高等无机化学 | 32 | 2 | 春 |
| CC64205 | 高等分析化学 | 32 | 2 | 秋 |
| CC64206 | 高等有机化学 | 32 | 2 | 秋 |
| CC64207 | 合成化学 | 32 | 2 | 秋 |
| CC64208 | 化学模拟理论与方法 | 32 | 2 | 春 |
| CC64106 | 量子化学基础 | 32 | 2 | 春 |
| CC64211 | 波谱学原理与应用 | 32 | 2 | 春 |  |
| CC64212 | 有机合成化学 | 32 | 2 | 秋 |  |
| CC64213 | 物理有机化学 | 32 | 2 | 春 |  |
| CC64214 | 功能材料制备工艺基础 | 32 | 2 | 秋 |  |
| CC64216 | 高等高分子化学 | 32 | 2 | 秋 |  |
| CC64217 | 高分子凝聚态物理 | 32 | 2 |  秋 |  |
| CC64218 | 高分子研究方法 | 32 | 2 | 秋 |  |
| CC64219 | 统计热力学 | 32 | 2 | 秋 |  |
| CC64220 | 群论在化学中的应用 | 32 | 2 | 秋 |  |
| CC64244 | 材料化学与物理 | 32 | 2 | 秋 |  |
| CC64111 | 生化分析原理与技术 | 32 | 2 | 秋 |  |
| CC64112 | 高等分子生物学 | 32 | 2 | 春 |  |
| 选修课推荐列表 | PE65001 | 体育健身课 | 32 | 1 | 秋 | 必修 |
| CC64248 | 化学学科发展前沿专题 | 16 | 1 | 春 | 必修 |
| CC64221 | 材料热力学 | 32 | 2 | 秋 |  |
| CC64225 | 纳米材料与纳米结构 | 32 | 2 | 秋 |  |
| CC64226 | 分子设计原理与应用 | 16 | 1 | 春 |  |
| CC64229 | 新型无机材料概论 | 16 | 1 | 秋 |  |
| CC64230 | 医用高分子 | 32 | 2 | 春 |  |
| CC64231 | 高分子光化学技术与应用 | 32 | 2 | 秋 |  |
| CC64233 | 光电功能高分子 | 32 | 2 | 春 |  |
| CC64234 | 电子结构理论与计算应用 | 32 | 2 | 秋 |  |
| CC64235 | 第一性原理方法及应用 | 32 | 2 | 秋 |  |
| CC64236 | 分子动力学模拟原理和应用 | 32 | 2 | 春 |  |
| CC64243 | 催化科学与工程 | 32 | 2 | 秋 |  |
| CC64245 | 功能与智能材料——结构演化与结构分析 | 32 | 2 | 春 |  |
| CC64246 | 人工智能化学 | 32 | 2 | 春 |  |
| CC64247 | 超分子化学 | 32 | 2 | 秋 |  |
| CC64249 | 化学信息学 | 24/8 | 2 | 春 |  |
| CC64172 | 扫描探针显微技术与纳米加工 | 32 | 2 | 秋 |  |
| CC64140 | 生物医用材料 | 32 | 2 | 春 |  |
| CC68112 | 研究生综合实验 | /48 | 2 | 春 |  |
| CC68110 | 物质结构及组成分析实验 | /48 | 2 | 春 |  |
| CC68102 | 化学电源制造工程（校内实践基地） | /48 | 2 | 春 |  |
| 必修环节 |  | 1.5学年综合测评 |  |  | 秋 | 必修 |
| GS68001 | 社会实践 |  | 1 | 春 |
| CC68101 | 经典文献阅读及学术交流 |  | 2 |  |
| CC69101 | 学位论文开题 |  | 1 | 春 |
| CC69102 | 学位论文中期 |  | 1 | 秋 |

说明：

1. 化学学科学术学位硕士研究生的总学分要求不少于30学分，其中学位课不少于17学分，选修课学分不少于8学分，必修环节5学分。

2. 学位课程为考试课程，选修课程一般为考查课程（可选本方案所列课程以外，任意外院系的课程）。学术学位硕士研究生课程学习一般应在入学后0.75学年内完成。

3. 对1.5学年综合测评的要求：综合考核学生的课程成绩、导师评价、学术能力和德育情况，综合测评成绩分为优秀、良好、中等、合格和不合格。考核成绩合格及以上可获得1学分，不合格需进行二次测评。考核成绩为优秀、良好的可申请攻读博士学位，考核成绩为优秀的可申请硕士提前毕业（在第四学期末申请答辩）。

4. 对社会实践的要求：具体实践方式参见《研究生社会实践学分实施意见》。

5. 对经典文献阅读的要求：学生至少阅读30篇本学科领域近五年的优秀文献，并在二级学科或课题组做公开学术报告。经典文献目录见文后，目录中的文献阅读至少20篇。学术报告需在开题前完成，并经专家组评议考核通过后获得1学分。

6. 对学术交流的要求：两年内至少参加二级学科或课题组指定的学术交流5次（包括听专家讲学，做学术报告等）或参加学术会议（线上、线下均可）、省部级及以上创新创业竞赛1次（前三名），并提供相关证明材料后获得1学分。

**学院党委意见： 学位评定分委员会意见：**

**签字： 签字：**

**学院意见：**

**签字：**

 **日期：**

**附件：**

**学术学位研究生经典文献目录**

**学科代码：0703 学科名称：化学**

高分子

1. T. Yokozawa and Y. Ohta. Transformation of Step-Growth Polymerization into Living Chain-Growth Polymerization. Chemical Review, 116: 1950–1968, 2016
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应用化学

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实验中心

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