

# 中国分析测试协会分析测试科学奖

(2024 年度)

成果名称：环境污染物新型采样、磁性微富集技术与碳点荧光  
探针方法与原理

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## 成果主要内容：

典型环境污染物特别是新污染物通过多种途径进入到环境，对环境及人体健康构成严重影响。基于此，本研究开发了新型被动半透膜及连续流动被动采样器，阐明了污染物富集动力学机制及等温吸附模型，进行了河流、污水、近岸海水及极地地区水体的污染现场检测，开展了极地地区污染物传输的相关影响因子研究，采样器展现了突出的性能；采用氧化石墨烯、 $\beta$ -环糊精、 $C_{60}$ 等修饰磁性树枝状聚合物材料建立了环境水样中痕量重金属离子、多环芳烃、饮品中双酚类污染物、多氯联苯的高效分析新方法，阐明了吸附动力学机制及吸附等温模型；应用小分子碳源合成了系列碳点，制备了磁性分子印迹、温敏性磁性分子印迹材料，构建了检测典型环境污染物及新污染物的系列荧光探针，集成温敏性磁性分子印迹材料的易分离、碳点荧光探针的灵敏性、磁性固相萃取的高效富集性、温敏材料的温敏特性，设计构建了典型环境污染物及新污染物的灵敏分析方法，显著提升了检测灵敏度及选择性，阐明了相关检测机制及吸附动力学与吸附过程的吸附等温线模型。本研究成果的对象多数属新污染物，开发的采样器及设计构筑的微富集与高灵敏检测方法成本较低、易于推广，为当前的新污染物治理行动计划及污染物监测新方法与技术开发提供了强力的技术支持与参考。

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