

以NF薄膜去除水中農藥之研究：背景水質特性與薄膜種類的影響

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摘要

本研究探討不同背景離子(氯化鈉、硫酸鈉)、背景水質(去離子水、自來水、地下水)和NF薄膜(NF90、NF270、NTR)對農藥(Atrazine、Diuron、Dichlorvos、Isoproturon、Monocrotophos、Simazin、Simetryn)分離成效的影響。薄膜對農藥的去除成效分別為NF90 > NF270 > NTR。若增加壓力，溶質通量與溶劑通量均隨之增加，其去除率則視二者通量的相對增幅而定。Diuron的分子量及分子寬度較大，空間障礙效應是影響去除率高低的主要因素；至於NTR薄膜之去除率隨農藥的logKow越大有遞增趨勢，而農藥的pKa則反之。在背景離子存在時，薄膜結構變得更緊密，因此穩態清水通量會下降。若NaCl、Na₂SO₄濃度為39.5mg/L時，對Simazin、Simetryn、Dichlorvos的去除率均會增加。至於背景水質對去除率的影響，大致隨背景成分越多而越差，排序為自來水 > 原水。背景成分對去除率的影響不一，Atrazine和Simazin因背景成分於薄膜介面產生靜電效應使去除率增加，而Dichlorvos和Simetryn則是有顯著的空間障礙效應使去除率增加；至於Diuron、Isoproturon、Monocrotophos則隨背景成分的存在，其去除率降低。

關鍵詞：NF90；NF270；NTR；Atrazine；Diuron；Dichlorvos；Isoproturon；Monocrotophos；Simazin；Simetryn；背景離子；背景水質

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