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Simple Synthesis of Multi-*2H,5aH*-1,8-Dihalogen Pyrazino[1,2-*cd*]indole-1,8(2*H*,5*aH*)-diones

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Abstract

A concise and efficient one-pot synthesis of multi-halogen pyrazino[1,2-*a*]indole-1,8(2*H*,5*aH*)-dione (MHPID) derivatives by the reaction of an enamino ester with multi-halogen benzoquinone derivatives is described. MHPIDs **3a–3d** were obtained with good yields (78–83%) by refluxing enamino esters **1a** and **1b** and tetrahalogen-1,4-benzoquinones **2a** and **2b** for 24 h without the use of catalysts. Compounds **3e–3p** were also obtained with excellent yields (69–92%) via the reaction of the phenyl-substituted enamino esters **1c–1h** with tetrahalogen-1,4-benzoquinones **2a** and **2b** in CH₃CN catalyzed by Cs₂CO₃. These two protocols are efficient and effective for the synthesis of MHPIDs.

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```