

Nitriles in Heterocyclic Organic Synthesis: Synthesis of Pyrano[2,3-*h*]coumarines, Pyrano[3,2-*c*]coumarines, and their Derivatives

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Several new 4H-pyrano[2,3-*h*]coumarines **5a-e** were prepared by the reaction of 7-hydroxycoumarinone with cinnamionitriles **1**. Also, the reaction of 7-hydroxycoumarinone with a mixture of aliphatic aldehydes and malononitrile afforded compounds **5f,g**. Similarly, 4-hydroxycoumarinone was reacted with the same reagents to give compounds **9a-g**. The reaction of **9g** with different nucleophilic reagents afforded the pyrimido[4',5':6,5]pyrano[3,2-*c*]coumarin-4-one derivatives **10-12**, 4-methyl-2-(ethoxymethylenamino)4H-pyrano[3,2-*c*]coumarin-3-carbonitrile (**13**) and pyrazolo[3',4';6,5]pyrano[3,2-*c*]coumarinone (**14**) respectively.