A convenient preparation of dityrosine via Mn(III)-mediated oxidation of tyrosine

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A simple method to rapidly and conveniently prepare dityrosine from L-tyrosine was developed using Mn(III) as an oxidizing agent. The maximum production of dityrosine was obtained from the 1 min equimolar reaction of L-tyrosine with Mn(III) acetate in 0.2 M sodium phosphate solution (pH 2.1) at 25 °C. After simple purification steps including filtration, removal of phosphate and remaining tyrosine, and separation by HPLC, pure dityrosine was obtained and its chemical structure was identified by NMR spectroscopy. Even though the yield was only 15.8%, this one-step Mn(III)-mediated oxidation of tyrosine allows dityrosine to be prepared in any laboratory without the need for expensive peroxidases or complicated, multi-step organic reactions.