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# 4-Formylphenyl 4-Ferrocenylbenzoate

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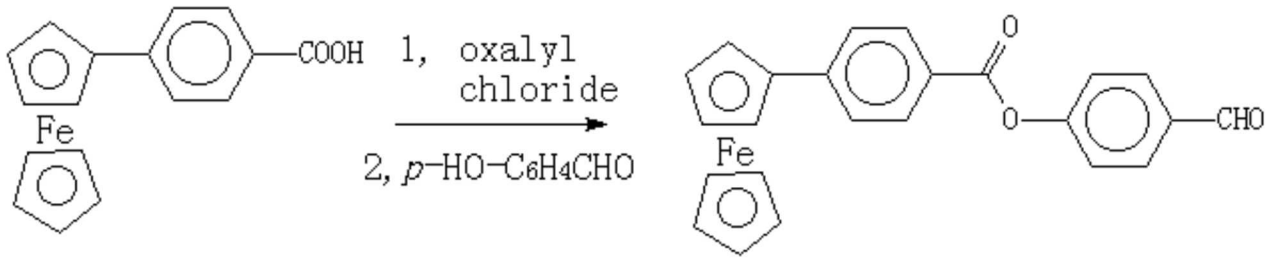


Ferrocene unit is comparatively large volume and it needs a longer molecular shape in geometry in to support the liquid crystal property [1]. 4-Formylphenyl 4-ferrocenylbenzoate contains a formyl group and can further condenses with amine, so it is a key intermediate for the synthesis of ester-Schiff's base ferocene-containg liquid crystal material. Following is the synthetic procedure. 4-Ferrocenylbenzoic acid [2] (9.6 g, 30 mmol) is dissolved in 150 ml of $CHCl_3$ and 7.5 ml oxalyl chloride is added. The mixture is refluxed 24 h with stirring under protection of $CaCl_2$ dry tube. The mixture is concentrated in vacuum. The residue is extracted with 180 ml of petroleum ether (boiling range 90-120°C) three times under refluxing. After cooling, the extracts give product as solid. The product is filtered and dried in vacuum to give 4-ferrocenylbenzoylchloride (8.2 g, 80% in yield, m.p. 134-135°C) and it can be used for next step without further purification. The mixture of 4-hydroxybenzaldehyde(3.1g, 25 mmol), 4-ferrocenylbenzoyl chloride (8.2 g, 25 mmol) and 2 ml pyridine in 100 ml benzene is refluxed 10 h under the protection of a $CaCl_2$ drying tube until the disappearance of acid chloride as monitored by thin-layer chromatography. After reaction has finished, the clear upper layer is decanted from the oily lower layer. After cooling, the product is collected by filtration to give 4-formylphenyl 4-ferrocenylbenzoate (8.0 g, yield 78%).

M.p.: 195-196°C.

IR(KBr, $cm^{-1}$): 1720, 1693, 1272.

$^1$HNMR ($CDCl_3$, 200 MHz): 10.04(1H, S, CHO), 7.57-8.13(4H, dd, J=8.26Hz, ArCHO), 7.41-8.01(4H, dd, J=8.38Hz, Fc-Ar), 4.46-4.78(4H, d, $C_5H_4$), 4.08(5H, S, $C_5H_5$).

Elemental analysis for $C_{24}H_{18}FeO_3$: calculated, C, 69.73; H, 4.36%. Found: C, 69.55; H, 4.52%.

## Reference

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2. Zhao, Ke-Qing; Hu, Ping and Xu, Hong-Bo. 4-Ferrocenylbenzoic Acid. *Molecules* **2001**, *6*, M246.

*Sample Availability:* Available from the authors and from MDPI.