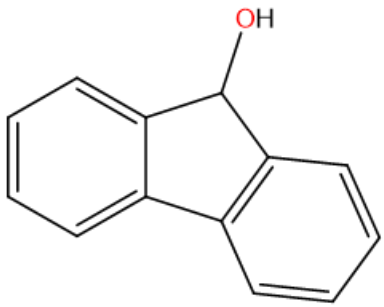
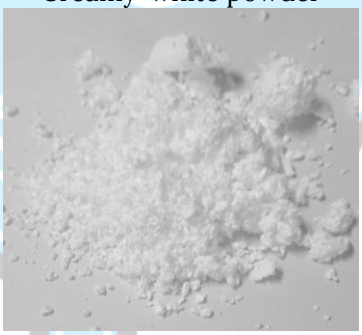
HYDRAFINIL

Analytical Report

The purpose of this document is to validate the chemical identity and purity of Hydrafinil based on experimental characterization techniques used in organic synthesis protocols. The experimental data can be contrasted with analytical reports from other suppliers.

IDENTIFICATION DATA

Structure	
Name	9-Fluorenol
Common name	Hydrafinil
Chemical formula	$C_{13}H_{10}O$
Molecular weight	182.222
CAS number	1689-64-1
Appearance	Creamy-white powder 

LABORATORY TECHNIQUES/EQUIPMENT

Melting point	Mel-Temp Apparatus – Electrothermal
Thin Layer Chromatography (TLC)	Aluminum TLC plate, silica gel coated with fluorescent indicator F254. Hexane-Ethyl acetate (12:3) as elution solvent
ATR-IR	Nicolet iS5 FTIR Spectrometer
^{1}H-NMR	Anasazi (60 MHz). $(CD_3)_2CO$

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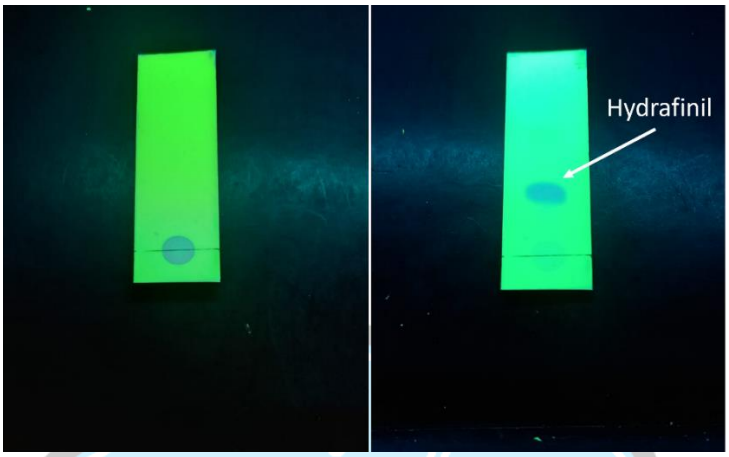
Melting point & TLC

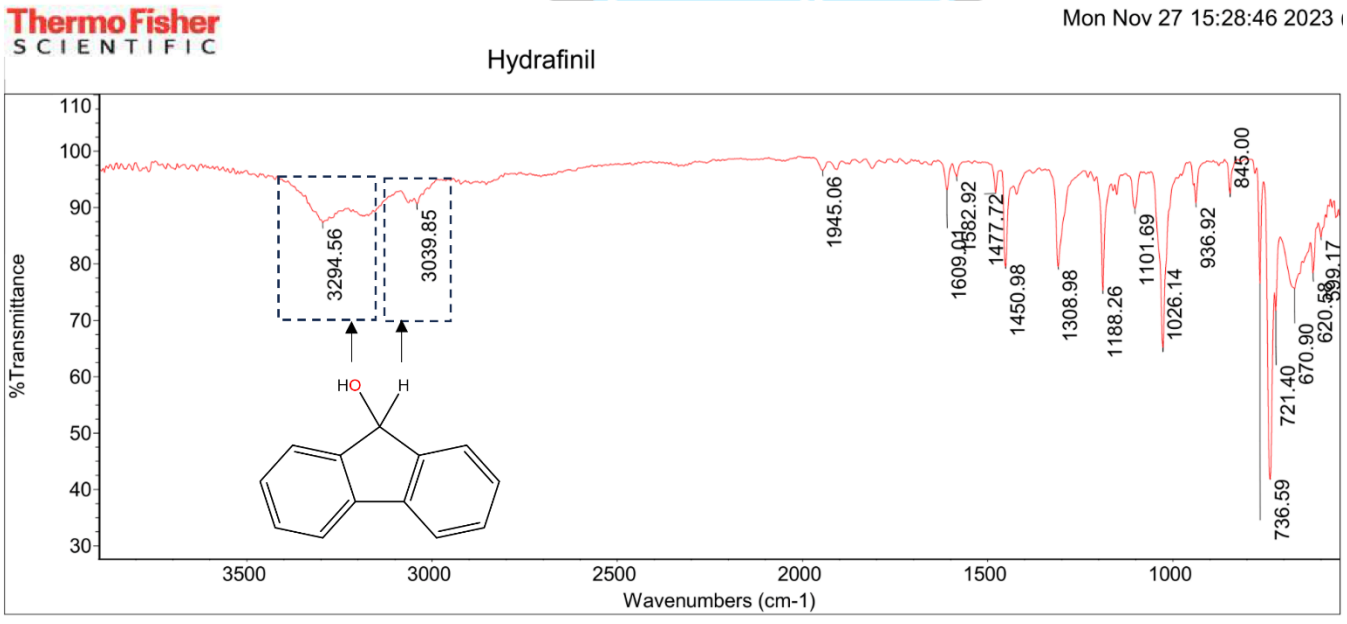
The creamy-white powder melts at 154 °C, which agrees with the reported melting point of 153–154 °C from literature.[1] The TLC plate shown a defined single spot with a Rf of 0.30, indicative of a single component.[2]



TLC plate of hydrafinil before and after elution

ATR-IR

The spectrum is in accordance with literature.[3,4] This shows the characteristics absorption bands of the -OH group at 3924 cm^{-1} and -CH bond stretching at 3039 cm^{-1}. The presence of these bands in the spectrum and the absence of the carbonyl bands (~1700 cm^{-1}, 9-fluorenone impurities) demonstrate the chemical identity and purity of the hydrafinil.



ATR-IR spectrum of Hydrafinil

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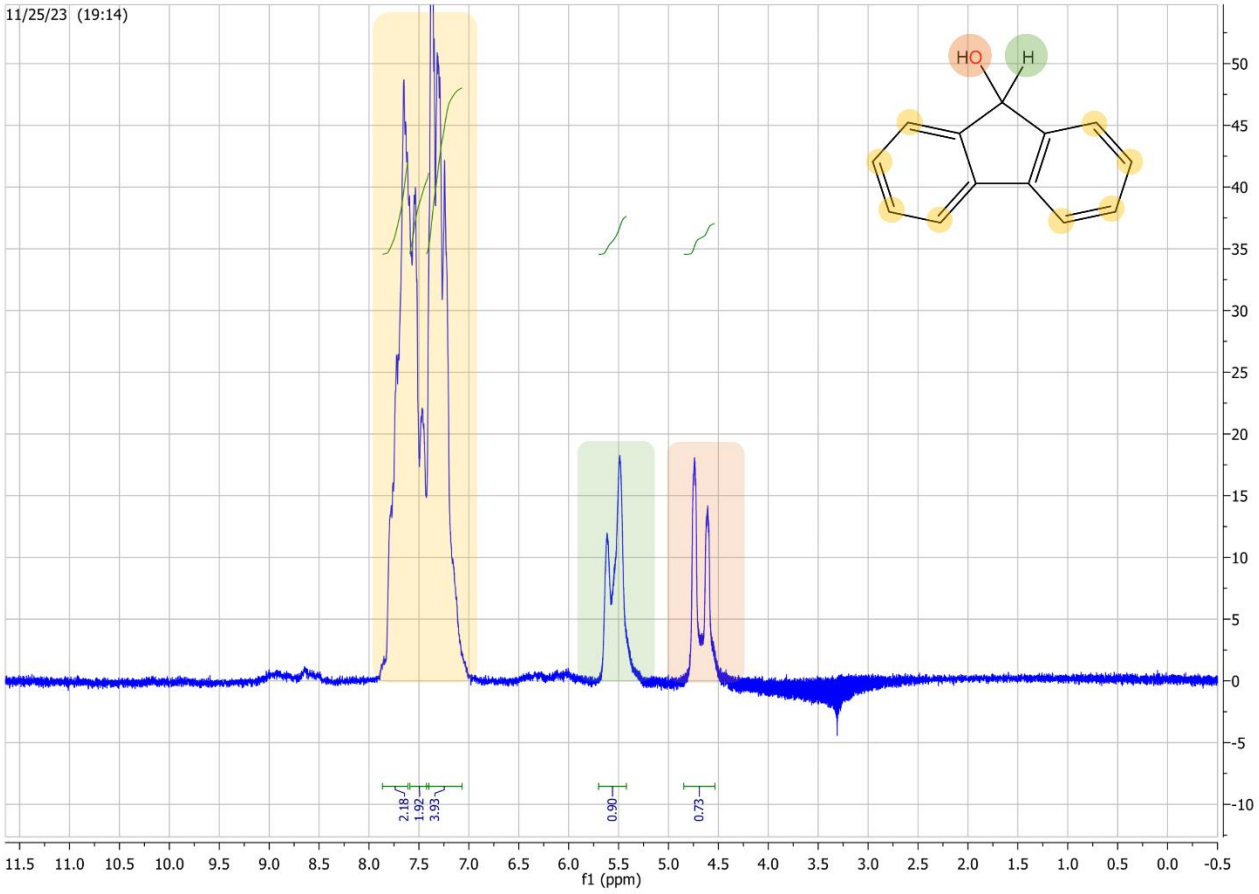
^{1}H-NMR (60 MHz)

The spectrum is in accordance with the literature.[5,6] The signals at 7.0 – 8.0 ppm arises from the aromatic protons, the C-H proton at 5.5 ppm and the O-H proton at 4.7 ppm (for clarity, hydrogen assignations in colours are shown).[7] The integration values match with the 10 hydrogens in the structure and the absence of other signals in the spectrum is a qualitative indicator of hydrafinil purity.



^{1}H-NMR spectrum of Hydrafinil in $(CD_3)_2CO$

REFERENCES

1. *J. Am. Chem. Soc.* 1974, 96, 9, 2948–2955
2. *Tetrahedron Letters*, 2019, vol. 60, # 36, art. no. 150993.
3. *Org. Lett.* 2010, 12, 17, 3874–3877
4. *Spectral Database for Organic compounds*. SDBS-NO=4909.
5. *Angew. Chem. Int.* 2012. Ed., 51: 12102-12106.
6. *J. Org. Chem.* 2023, 88, 13, 9388–9394.
7. *Oxidation and reduction.* Oxidation of 9-fluorenol. Anasazi experiment series.