

Supplementary data

Efficient, Recyclable, Heterogeneous Base Nanocatalyst for Thiazoles with a Chitosan-Capped Calcium Oxide Nanocomposite

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2.1. Apparatus, Instrumentations and Materials

Melting points of the synthesized compounds were obtained using an electrothermal Gallenkamp equipment (*GallenKamp, Lister, United Kingdom*) and are uncorrected. Fourier transform infrared spectra (FTIR) with a Nicolet Magna 6700 FT spectrometer (*Thermo Fisher Scientific, Waltham, M.A. United States*) were conducted in a wavenumber region (500–4,000 cm⁻¹). The mass spectra were measured on a GCMSQ1000-EX Shimadzu and GCMS 5988-A HP spectrometers (*Shimadzu, Kyoto, Japan*) with a 70-eV ionizing voltage. The ¹H- and ¹³C-NMR spectrums were recorded on a Varian Mercury VXR-300 spectrometer (300 MHz for ¹H-NMR and 75 MHz for ¹³C-NMR) and the chemical shifts were related to that of the solvent DMSO-*d*₆ (*Varian, Inc., Karlsruhe, Germany*). For SEM and EDX (*HRSEM, JSM 6510A, Jeol Ltd., Tokyo, Japan*) measurements, the thin films were cut into small pieces and put on the SEM stubs with carbon tape. Then the samples were coated with 4 nm thickness of platinum layer, after that transferred into SEM Teneo/Quattro for imaging. Images were taken under high vacuum with different magnifications. X-ray diffraction (XRD) patterns were studied using a Philips diffractometer (*Model: X'Pert-Pro MPD; Philips, now PANalytical, Malvern, Worcestershire, United Kingdom*) with Cu K α radiation (wavelength 1.5418 Å) at 40 kV and 40 mA. The

patterns were collected between 2θ of 10° and 40° , and the scan speed was 1.5 degree/min. Sonication was performed in Shanghai Branson-CQX ultrasonic cleaner (*Ecoclean Machinery (Shanghai) Co., Ltd., China*) at frequency of 40 kHz and ultrasonic power was kept at 250 W. Sodium hydroxide was purchased from Sigma-Aldrich Company. Triple distilled water was used in all solution preparations. Chitosan was provided by Sigma Aldrich (Shanghai, China) (powder, medium molecular weight, shrimp shells source, batch no. C3646, density = 0.15–0.3 g/cm³). Calcium oxide (nanopowder < 160 nm particle size (BET) 98%, product no. 634182) was purchased from Sigma-Aldrich. Sodium hydroxide (ACS reagent, $\geq 97.0\%$, pellets; product no. 221465), potassium hydroxide (reagent grade, 90%, flakes, product no. 484016), methanol (ACS reagent, $\geq 99.8\%$; product no. 179337), and acetic acid (glacial, ACS reagent, $\geq 99.7\%$; product no. 695092), were purchased by middle east supplier of Merck Company (Rahway, NJ, USA) and were used as such without further purification.

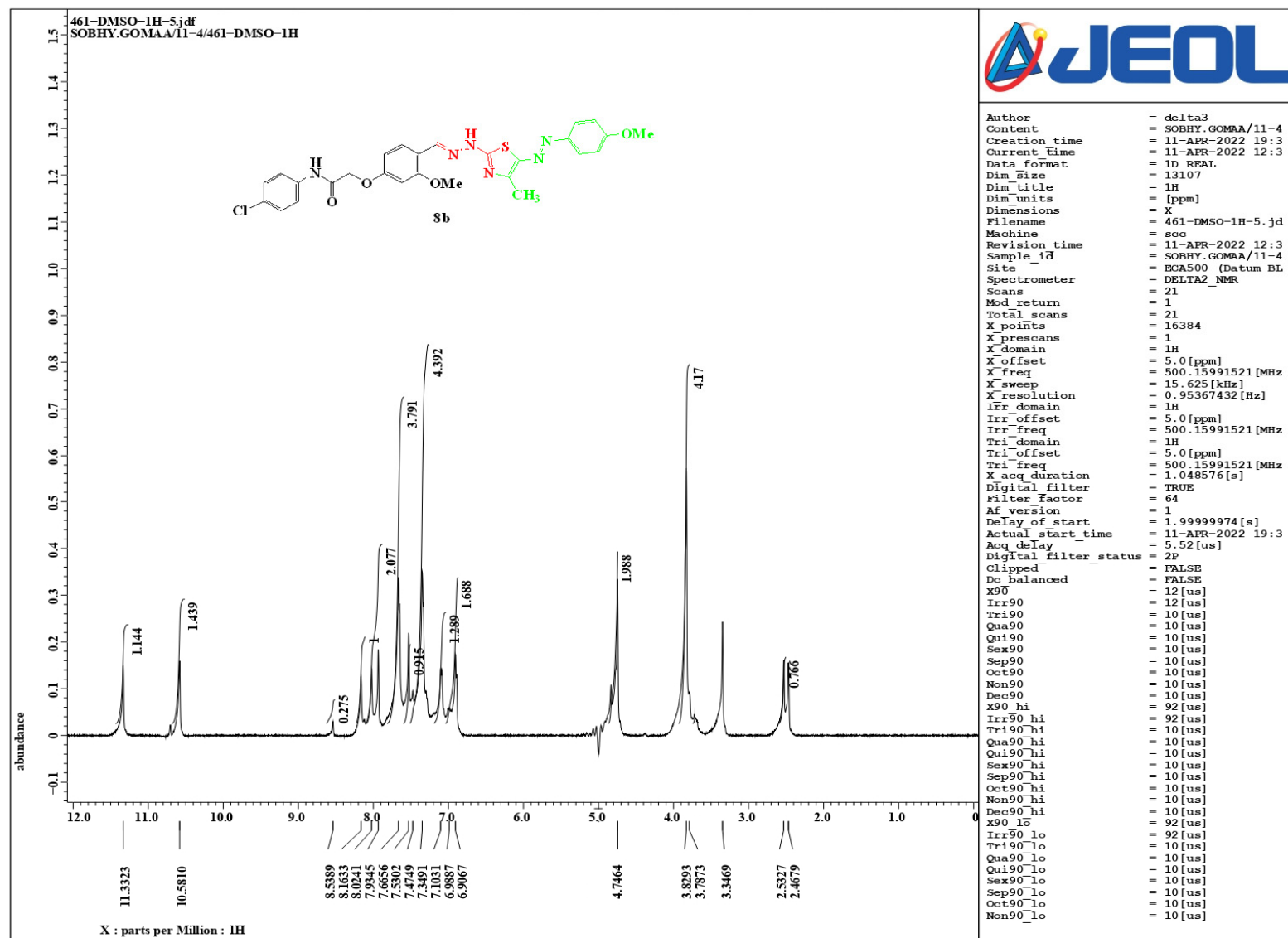


Figure S2. ¹H-NMR spectrum of compound 8b

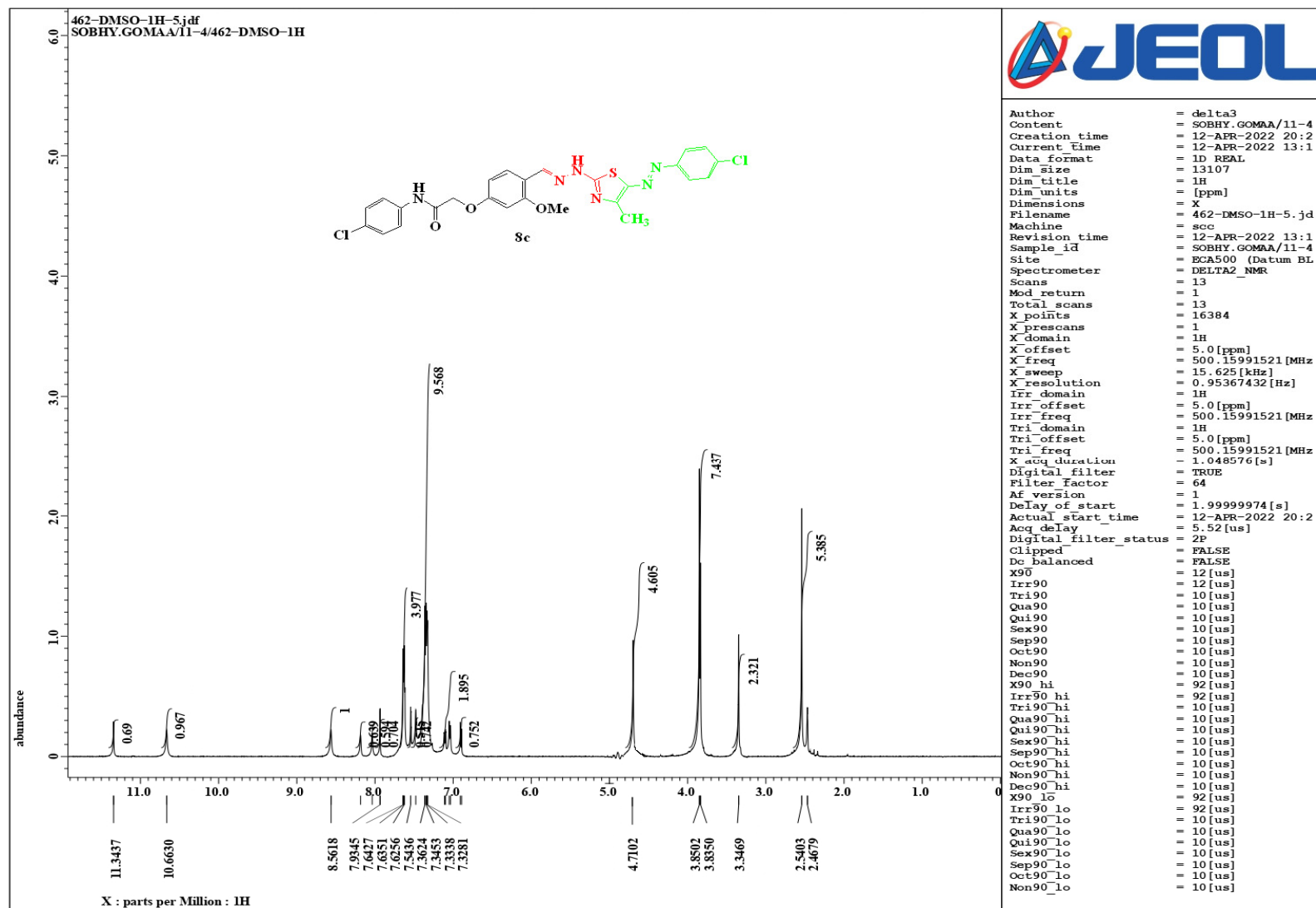


Figure S3. ¹H-NMR spectrum of compound 8c

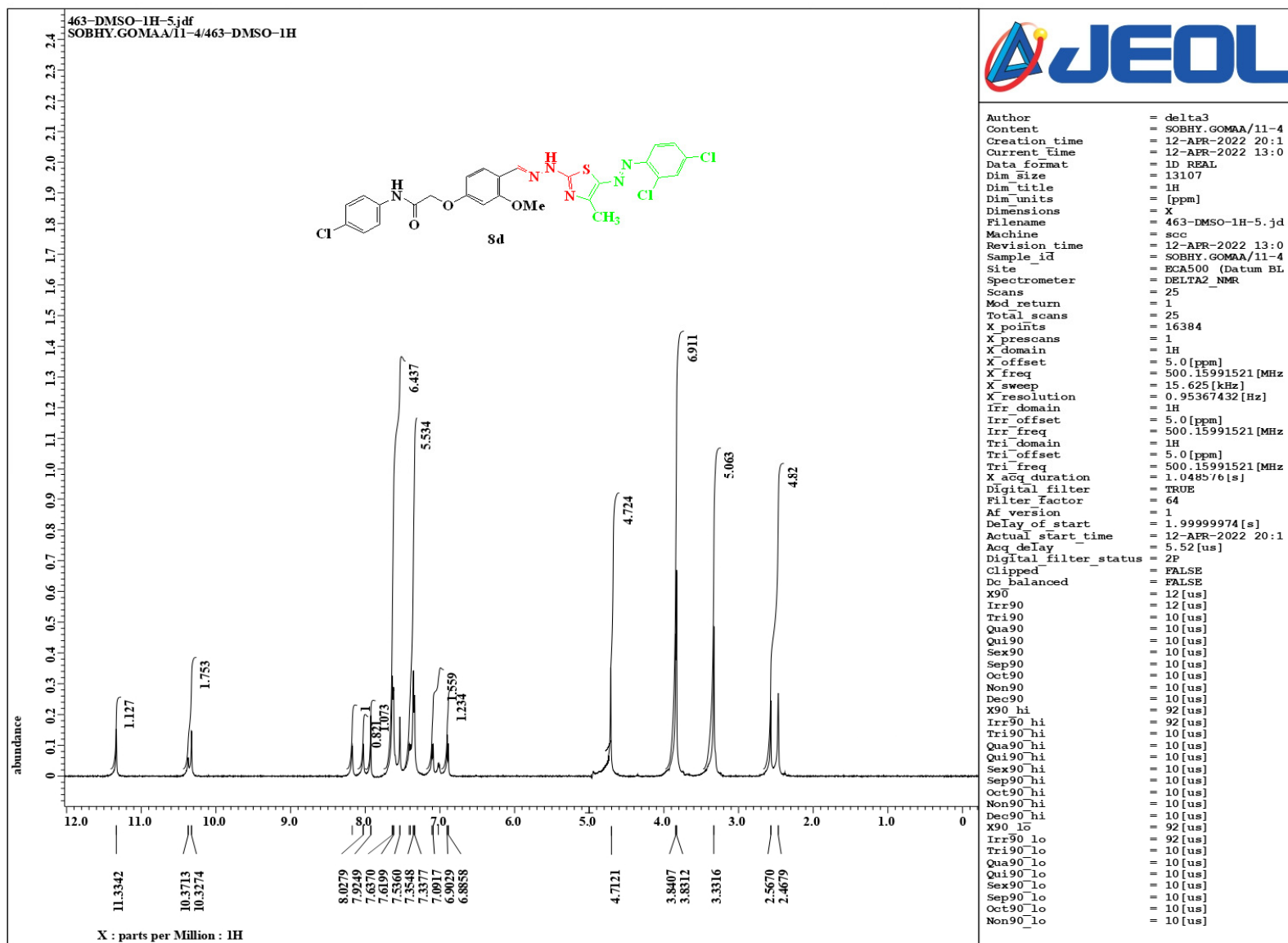


Figure S4. ¹H-NMR spectrum of compound 8d

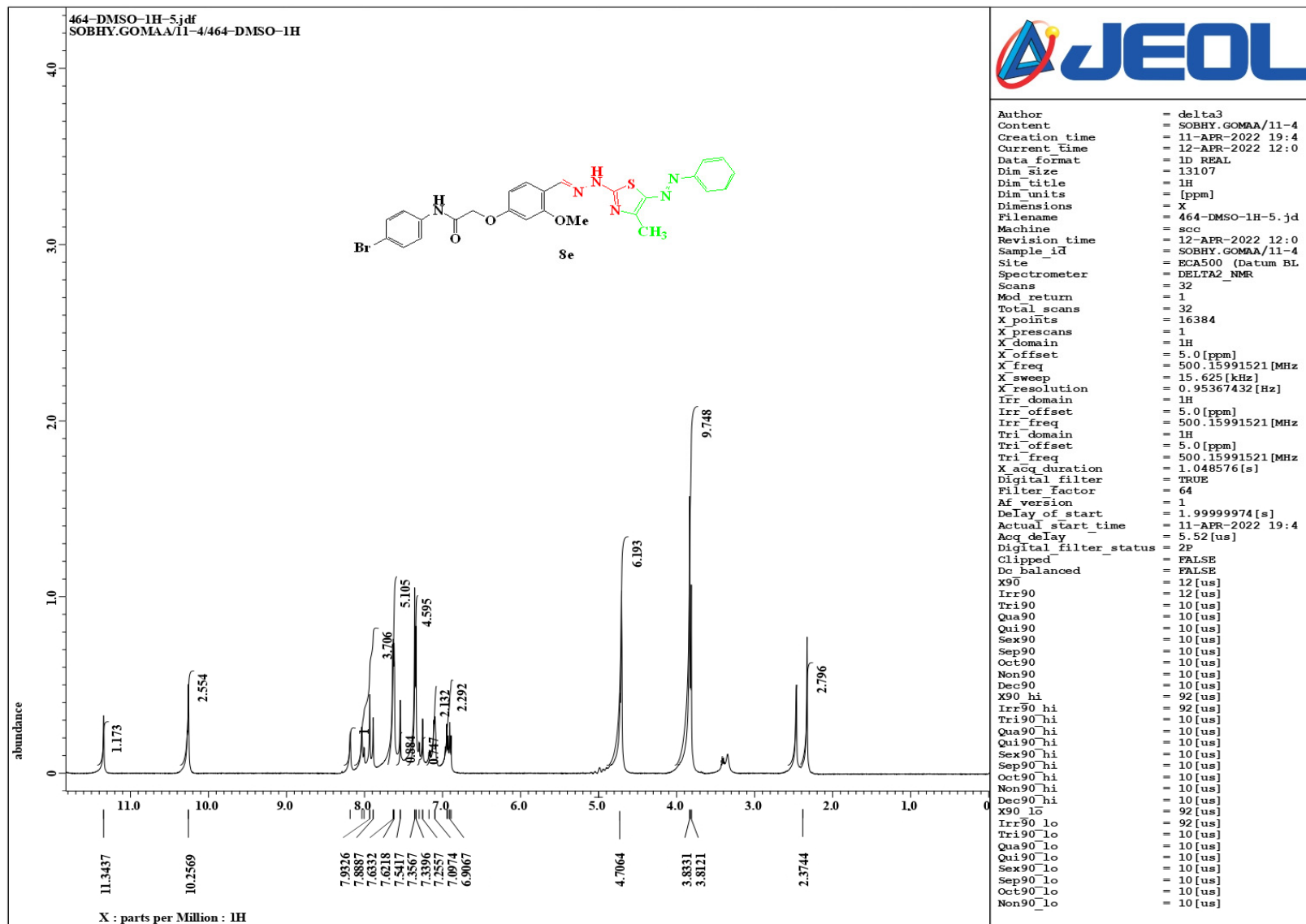


Figure S5. ¹H-NMR spectrum of compound **8e**

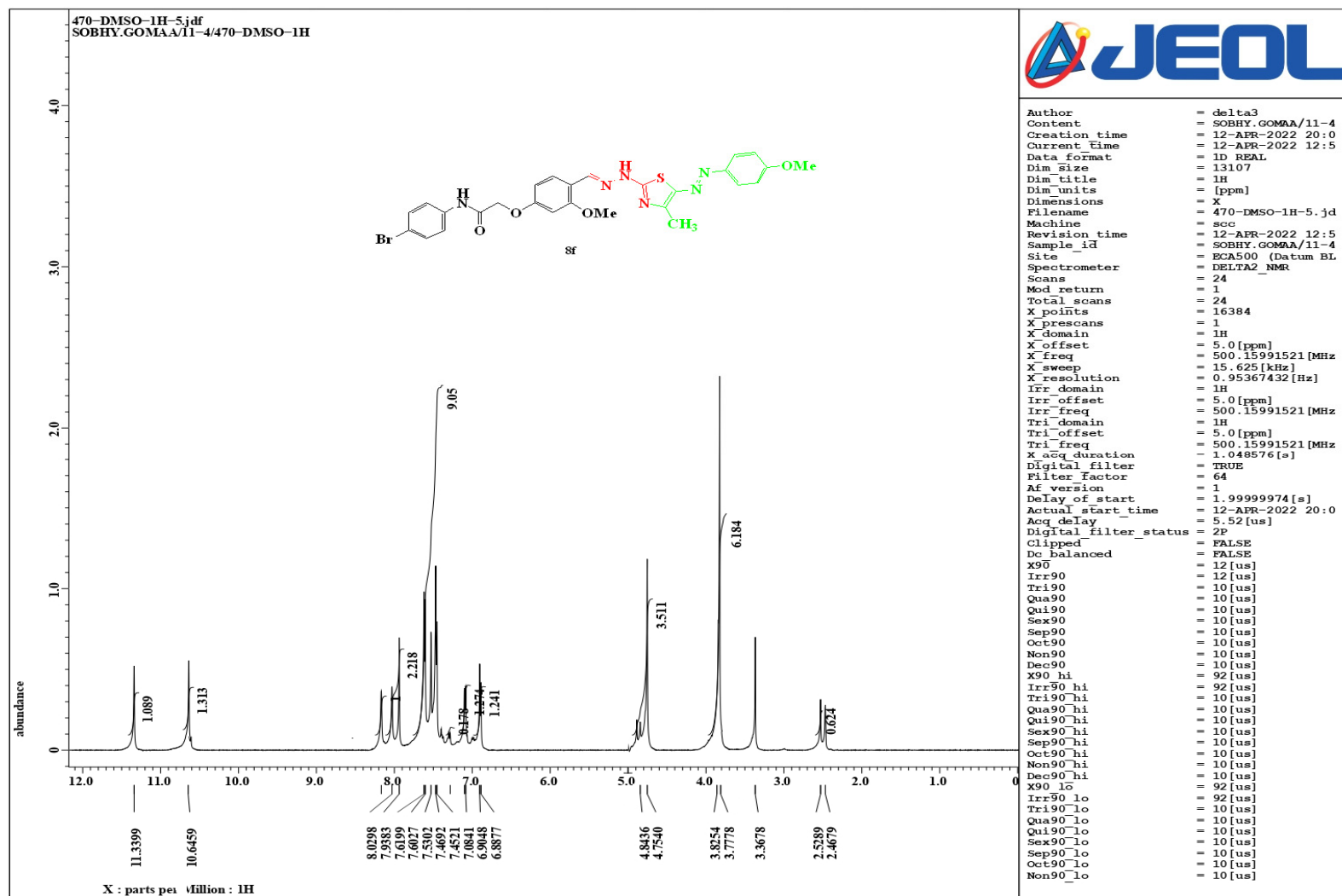


Figure S6. ¹H-NMR spectrum of compound 8f

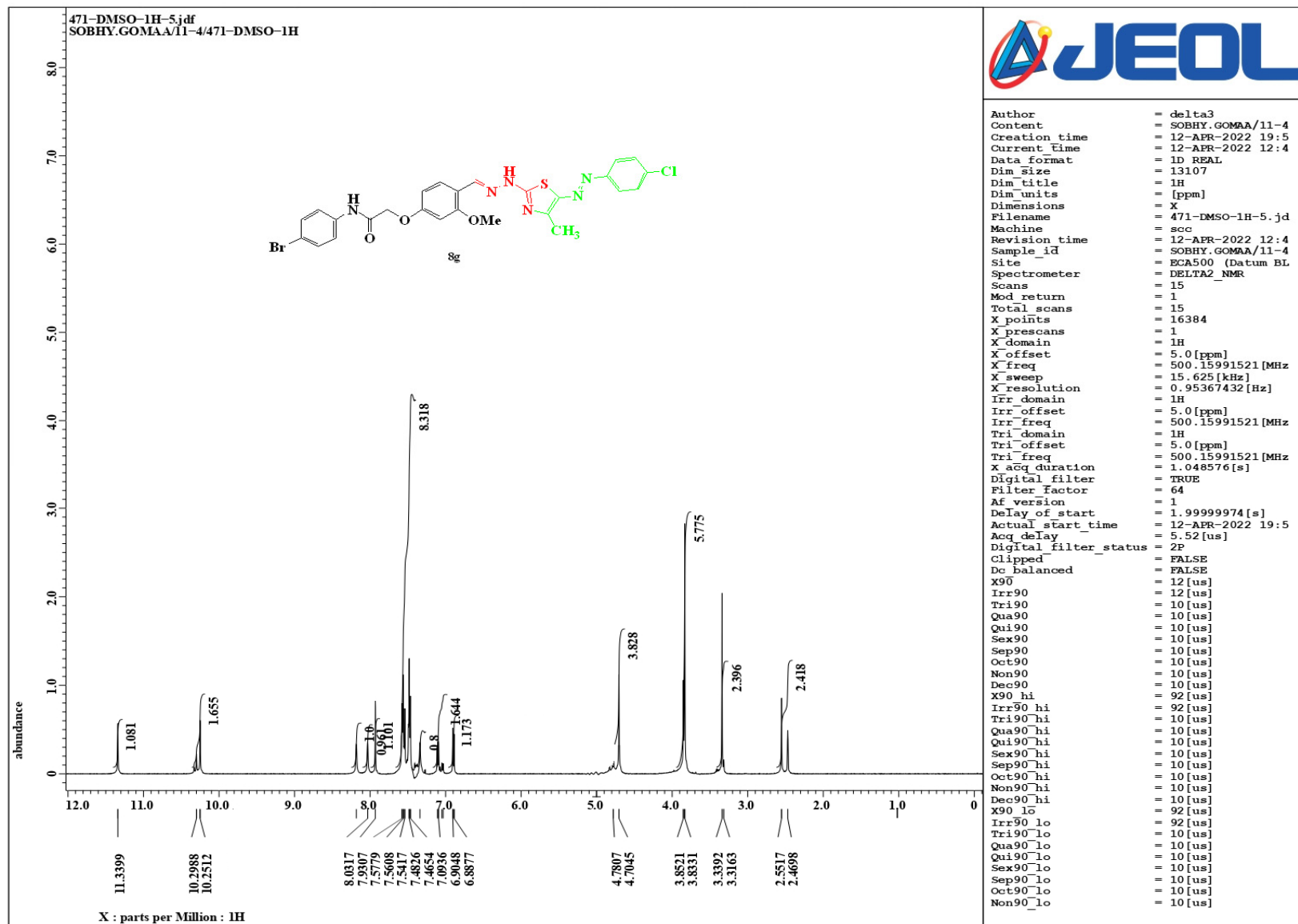


Figure S7. ¹H-NMR spectrum of compound **8g**