Exercise: Determine structure of a compound from $^1$H NMR spectrum.

C$_6$H$_5$NO$_3$

250 MHz $^1$H NMR Spectrum in Acetone-$d_6$

Source: Adam Fiedler/Reich g

[Diagram showing the NMR spectrum of a compound with peaks at various ppm values and a structure of the compound with nitro and hydroxyl groups.]
Exercise: Determine structure of a compound from $^1$H NMR spectrum.

$C_6H_5NO_3$
250 MHz $^1$H NMR Spectrum in Acetone-$d_6$
Source: Adam Fiedler/Reich g

There is a large difference between the two meta couplings: 0.9 and 2.4 Hz, reflecting the strong electronic effects of the OH and NO$_2$ substituents.

Both NO$_2$ and OH have larger chemical shift effects at the ortho than at the para position.