

Supplementary Information for

**Novelties of triphasic phase transfer catalysed Zinin reduction of
nitrochlorobenzene by H_2S -laden monoethanolamine**

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General Information:

Method of GC-FID and GC-MS:

In present work, GC-MS of model with FID detector has been used for analysis. The column used was DB-5MS capillary column with dimension $30\text{ m} \times 320\text{ }\mu\text{m} \times 0.25\text{ }\mu\text{m}$. The optimum programming conditions of GC is as follows:

- Oven Conditions: Initial Temperature: 60° C , Maximum Oven temperature: 324° C , Ramp 1 - 50° C/min , from 60° C to 190° C ; Ramp 2 - 15° C/min , form 190° C to 230° C .
- Column Flow rate (N_2)– 1.6 mL/min , Pressure – 16.724 psi ,
- FID detector conditions: Heater temperature- 300° C , Air flow rate- 400ml/min , H_2 fuel flow 30ml/min , makeup flow N_2 – 25 mL/min

The optimum programming conditions of MS is as follows:

- Column flow rate- 1mL/min , pressure- 7.6522 psi .
- Oven conditions: Initial Temperature: 60° C , Maximum Temperature- 324° C , Initial Temperature: 60° C , Maximum Oven temperature: 324° C , Ramp 1 - 50° C/min , from 60° C to 190° C ; Ramp 2 - 15° C/min , form 190° C to 230° C .

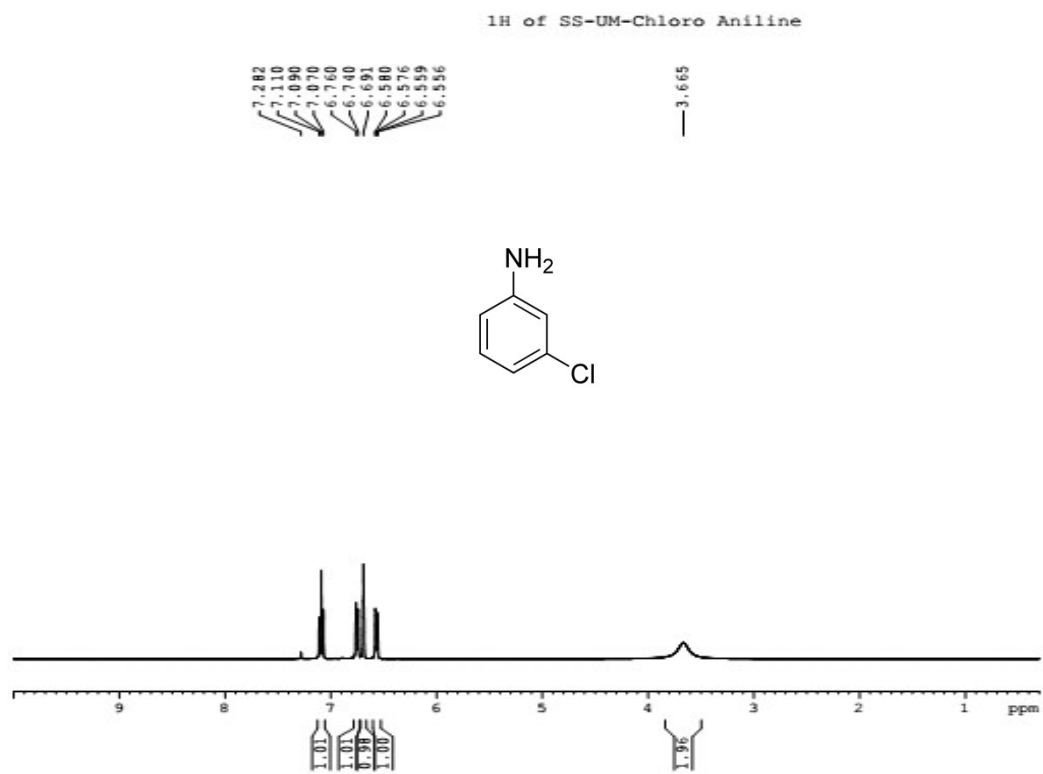


Figure S1: ^1H -NMR spectrum of m-chloroaniline in CDCl_3

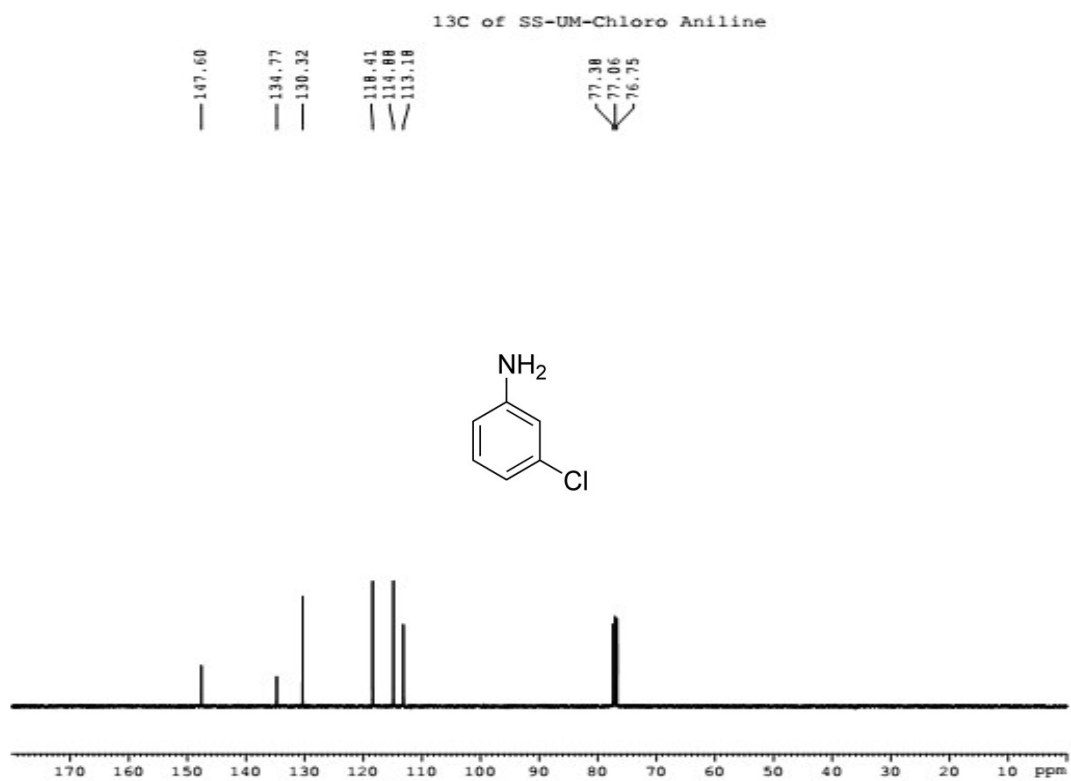


Figure S2: ^{13}C -NMR spectrum of m-chloroaniline in CDCl_3



m-Chloroaniline colourless liquid, $^1\text{H-NMR}$ (400 MHz, CDCl_3 , 293K, TMS) δ = 3.665 (2H, s), 6.556 (1H, dd, J = 6.8 & 1.2 Hz), 6.6691(1H, S), 6.780(1H, d, J = 8Hz), 7.670 (1H, t, J =8Hz); $^{13}\text{C-NMR}$ (400 MHz, CDCl_3 , 293K, TMS) 113.18, 114.88, 118.91, 130.32, 134.77, 147.60.

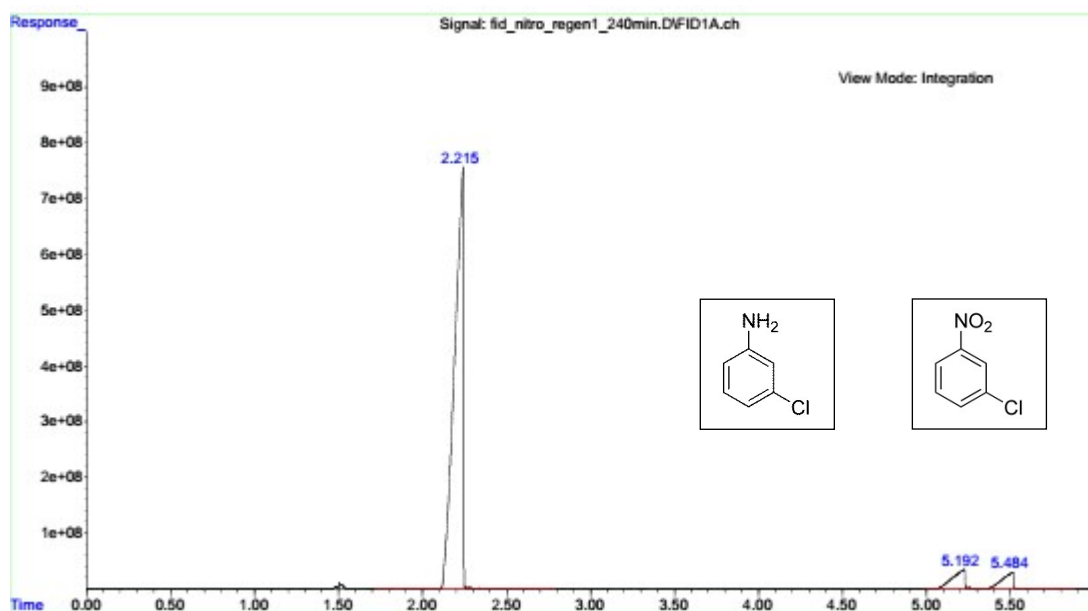


Figure S3: GC Spectra showing formation of m-chloroaniline from reactant m-chloronitrobenzene in solvent toluene.

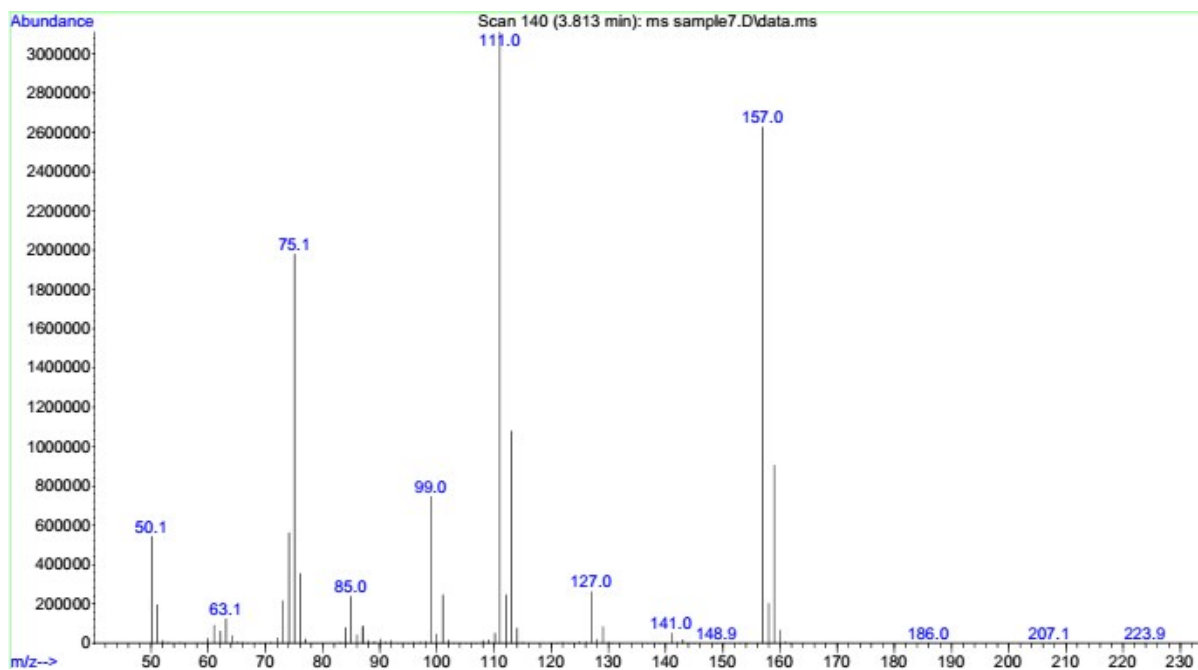


Figure S4: Mass spectra for all the peaks shown in Figure S3

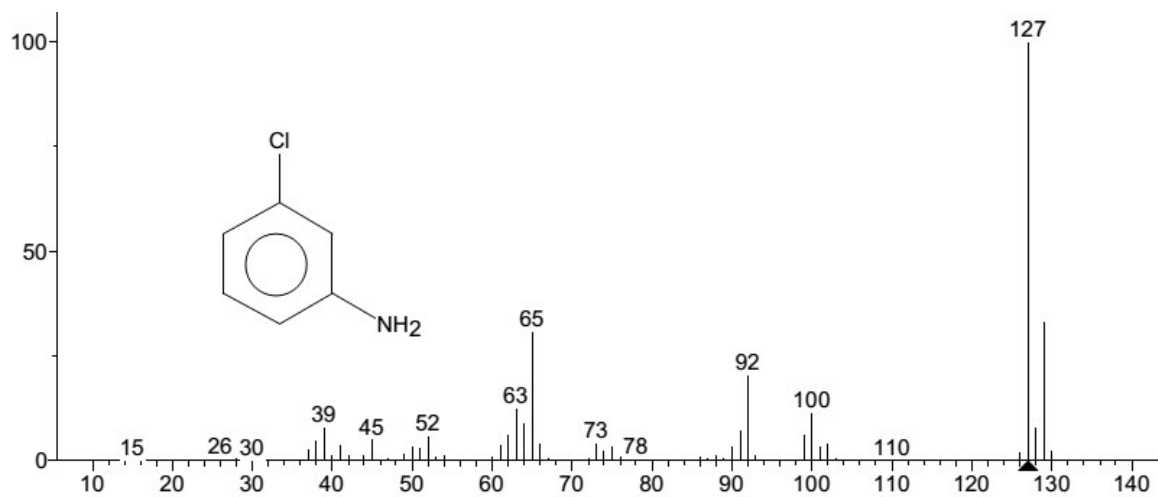


Figure S5: Mass spectra of product m-Chloroaniline