

## SUPPORTING INFORMATION

### For

#### One-pot synthesis of 2-amino-4H-chromene derivatives by Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>@Mg-Al-LDH as an effective and reusable magnetic nanocatalyst

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**Figure S1:** FT-IR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)

**Figure S2:** <sup>13</sup>C-NMR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)

**Figure S2:** <sup>1</sup>H-NMR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)

**Figure S4:** LC profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)

**Figure S5:** HR-MS profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)

**Figure S6:** FT-IR spectrum of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-Chromene-3-carbonitrile (**4b**)

**Figure S7:** <sup>13</sup>C-NMR spectrum of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)

**Figure S8:** <sup>1</sup>H-NMR spectrum of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)

**Figure S9:** LC profile of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)

**Figure S10:** HR-MS profile of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)

**Figure S11:** FT-IR spectrum of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)

**Figure S12:**  $^{13}\text{C}$ -NMR spectrum of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)

**Figure S13:**  $^1\text{H}$ -NMR spectrum of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)

**Figure S14:** LC profile of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)

**Figure S15:** HR-MS profile of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)

**Figure S16:** FT-IR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4d**)

**Figure S17:**  $^{13}\text{C}$ -NMR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4d**)

**Figure S18:**  $^1\text{H}$ -NMR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4d**)

**Figure S19:** LC profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4d**)

**Figure S20:** HR-MS profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4d**)

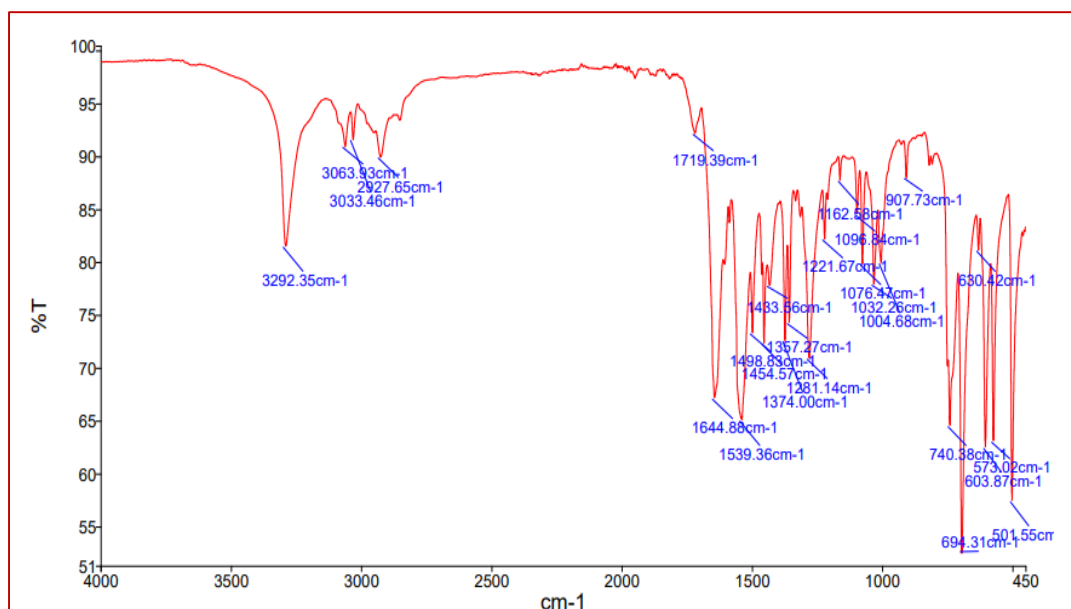
**Figure S21:** FE-SEM of recycled  $\text{Fe}_3\text{O}_4@\text{SiO}_2@\text{Al-Mg-LDH}$

**Figure S22:** EDS of recycled  $\text{Fe}_3\text{O}_4@\text{SiO}_2@\text{Al-Mg-LDH}$

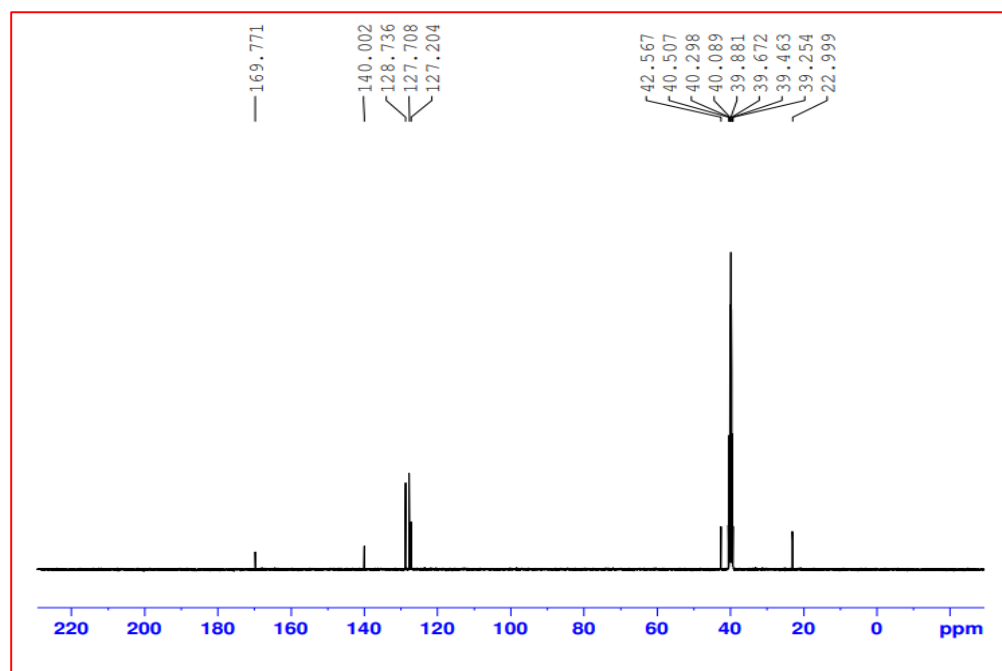
**Figure S23:** XRD profile of  $\text{Fe}_3\text{O}_4@\text{SiO}_2@\text{Al-Mg-LDH}$

**Figure S24:** FT-IR of recycled  $\text{Fe}_3\text{O}_4@\text{SiO}_2@\text{Al-Mg-LDH}$

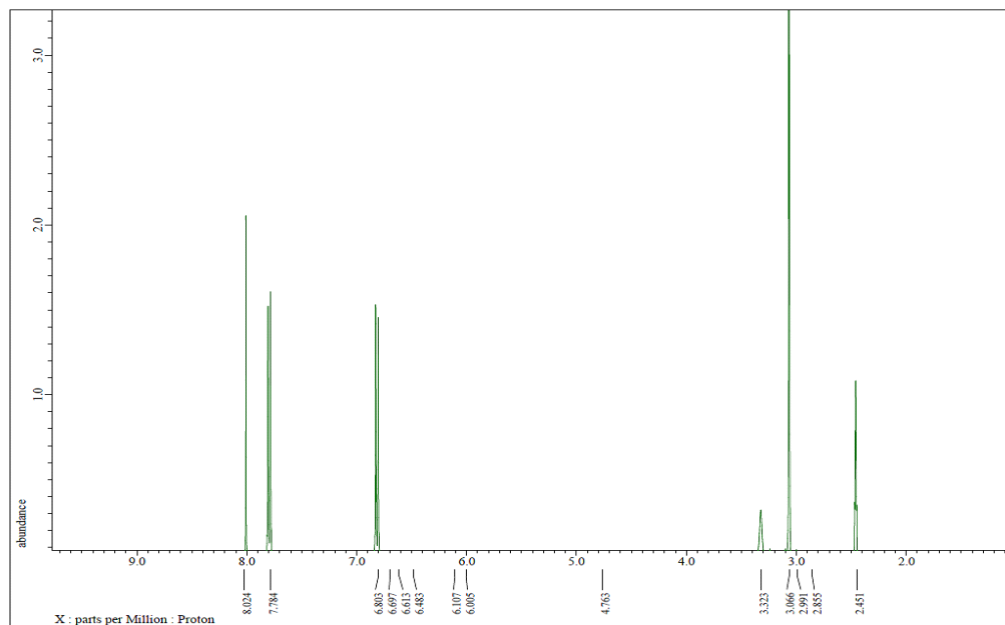
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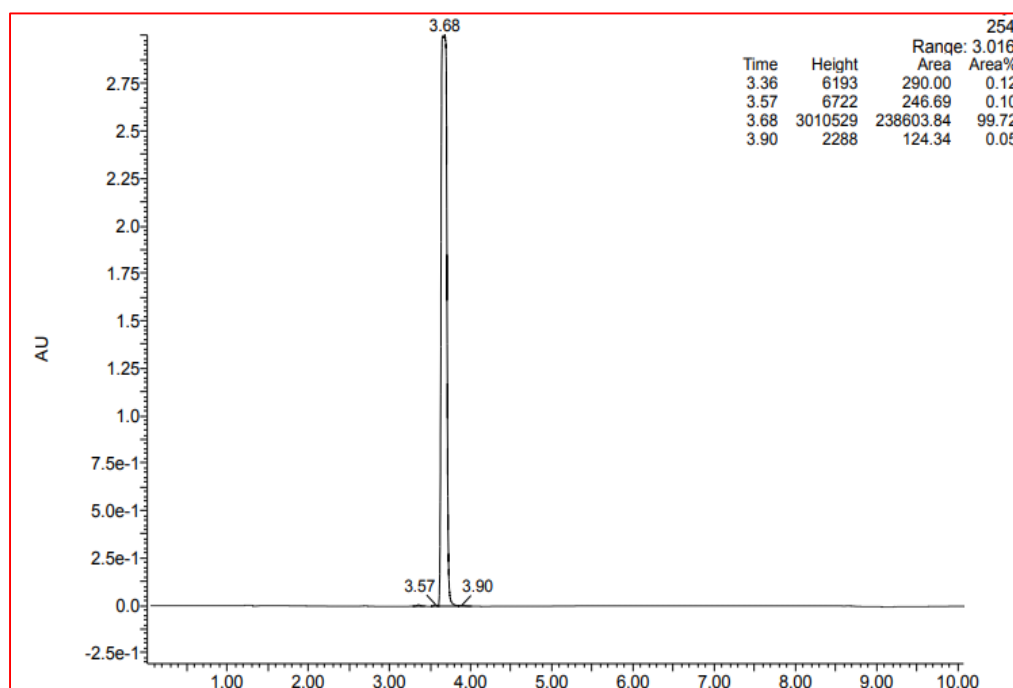
**Fig.S1** FT-IR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-Chromene-3-carbonitrile (**4a**)



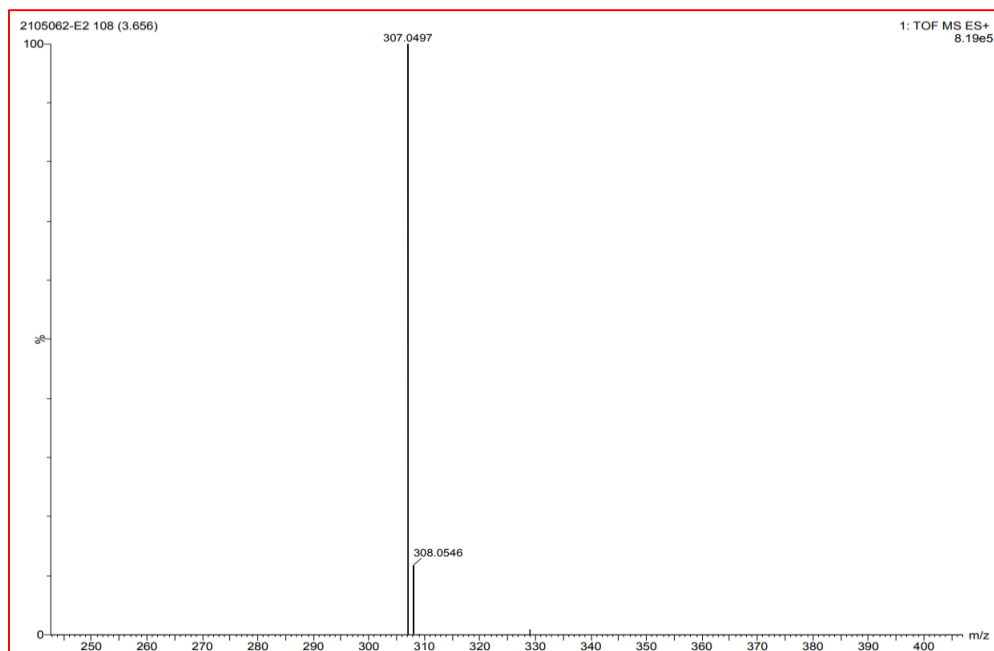
**Fig.S2** <sup>13</sup>C-NMR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-Chromene-3-carbonitrile (**4a**)



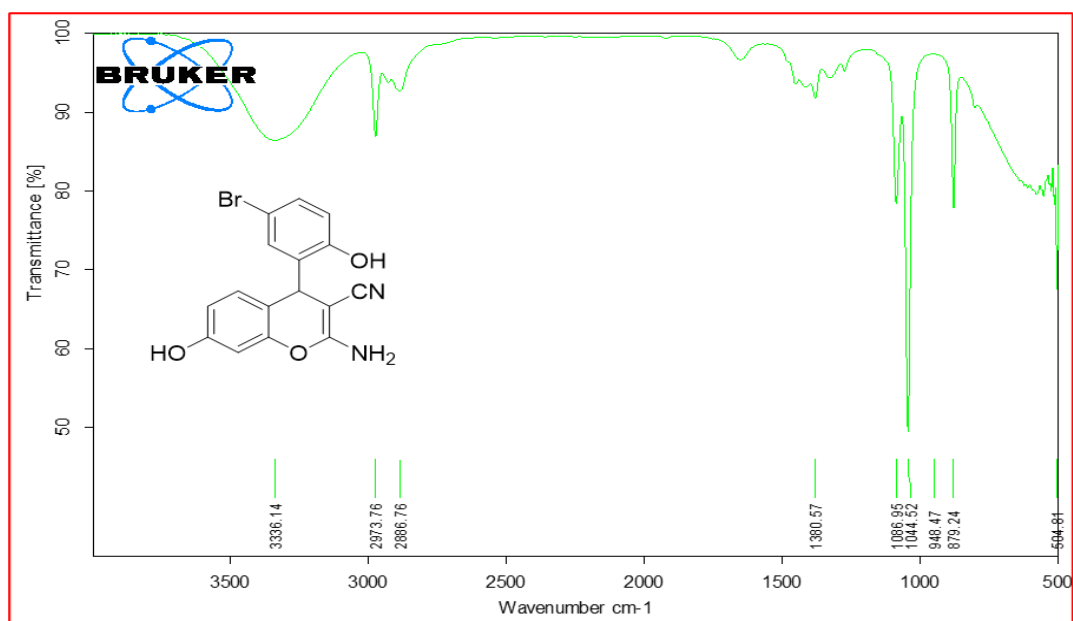
**Fig.S3**  $^1\text{H-NMR}$  spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)



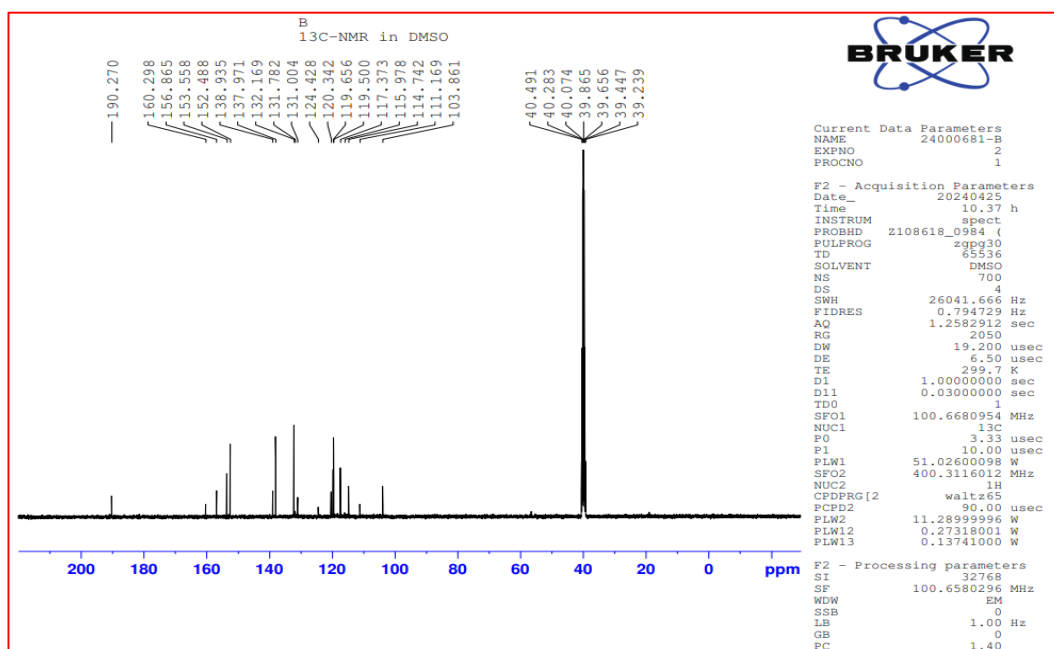
**Fig.S4** LC profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)



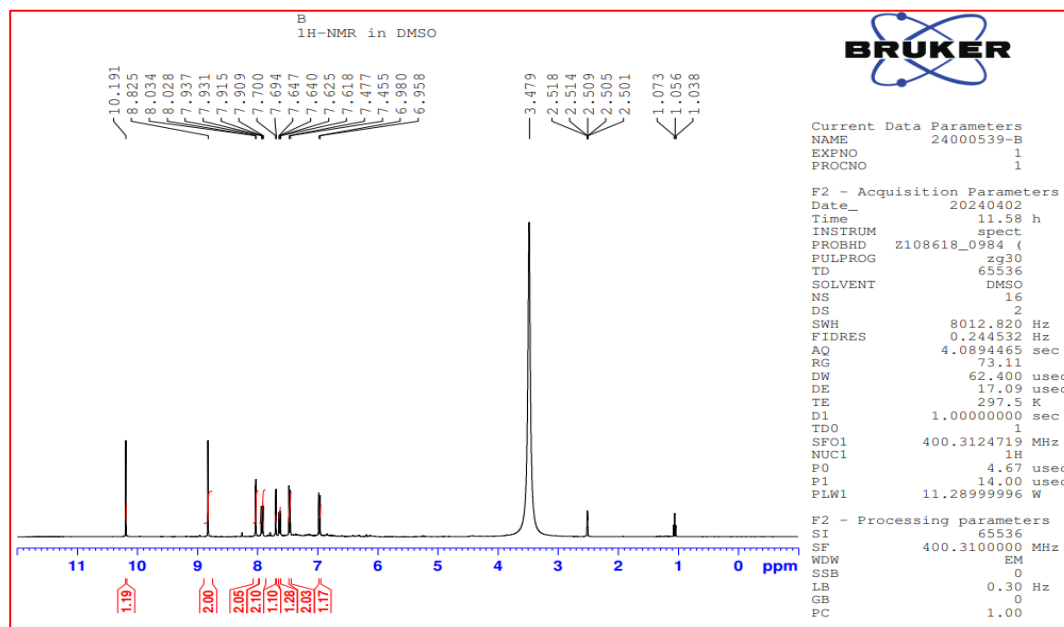
**Fig. S5** HR-MS profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4a**)



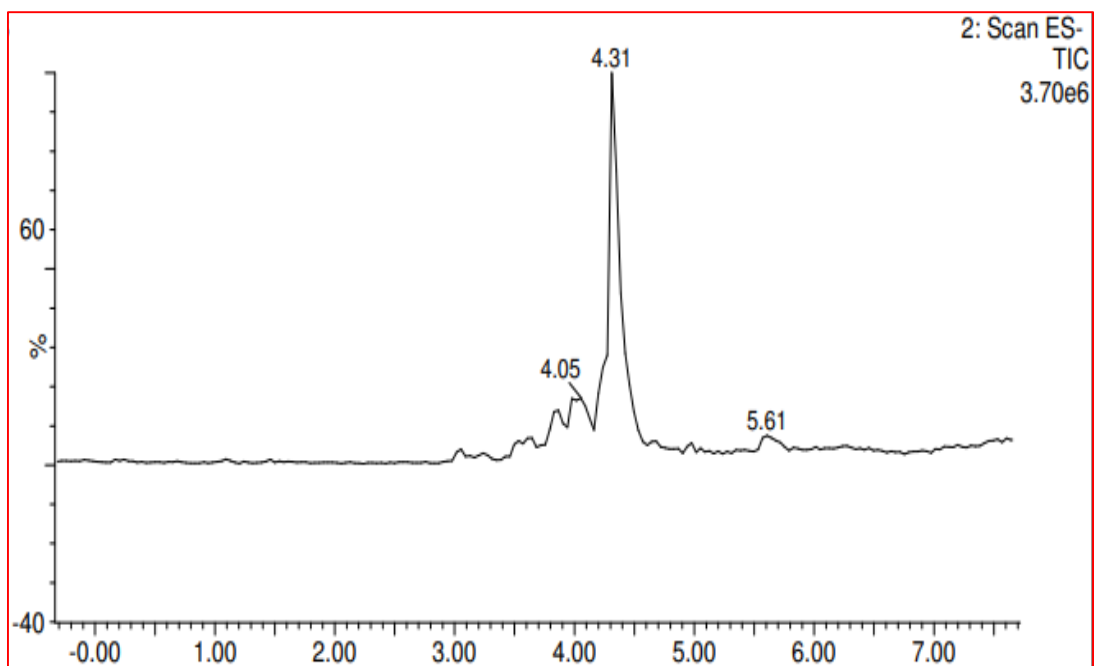
**Fig. S6** FT-IR spectrum of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)



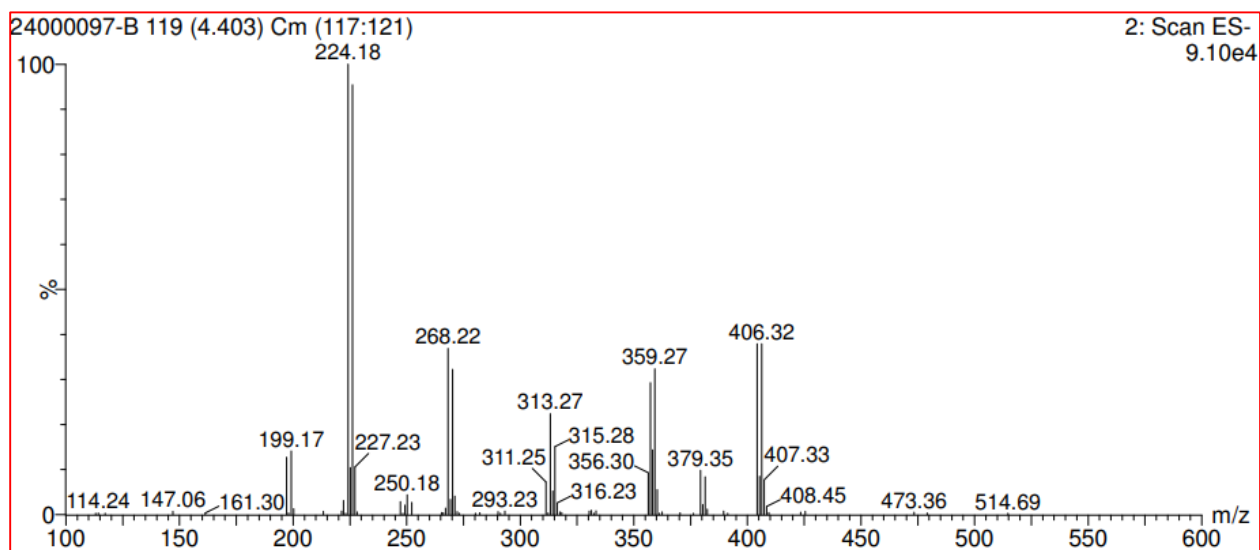
**Fig. S7**  $^{13}\text{C}$ -NMR spectrum of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-Chromene-3-carbonitrile (**4b**)



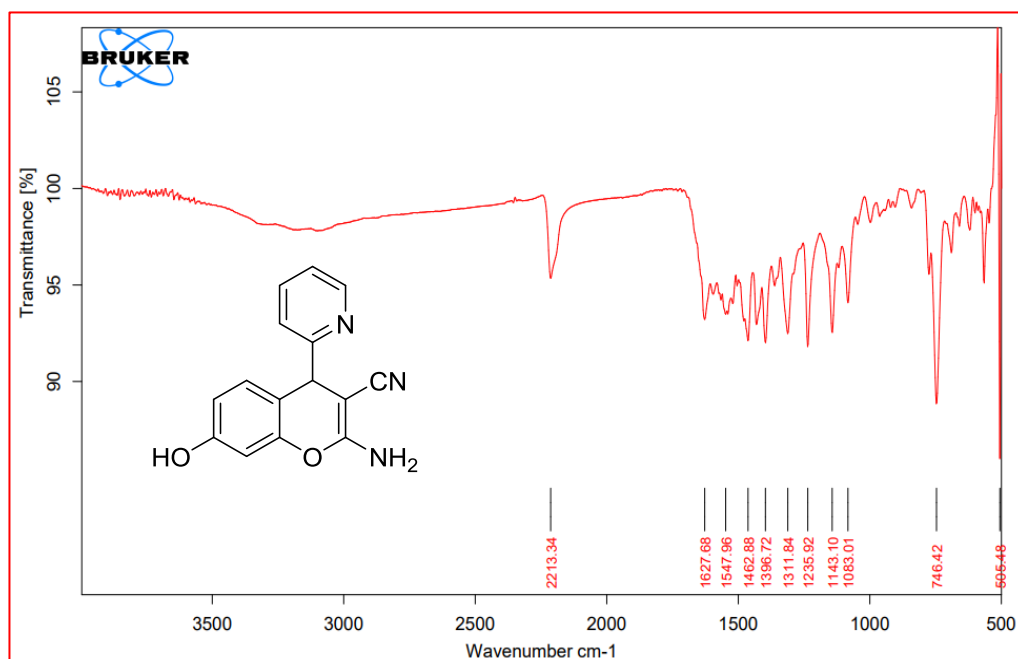
**Fig. S8**  $^1\text{H}$ -NMR spectrum of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)



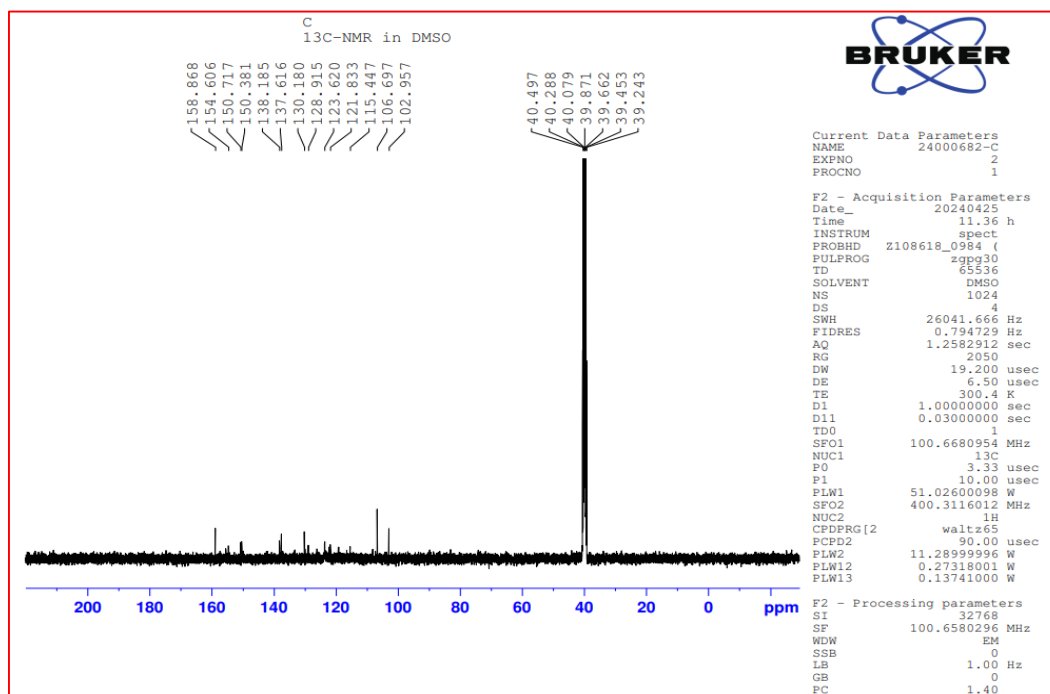
**Fig. S9** LC profile of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)



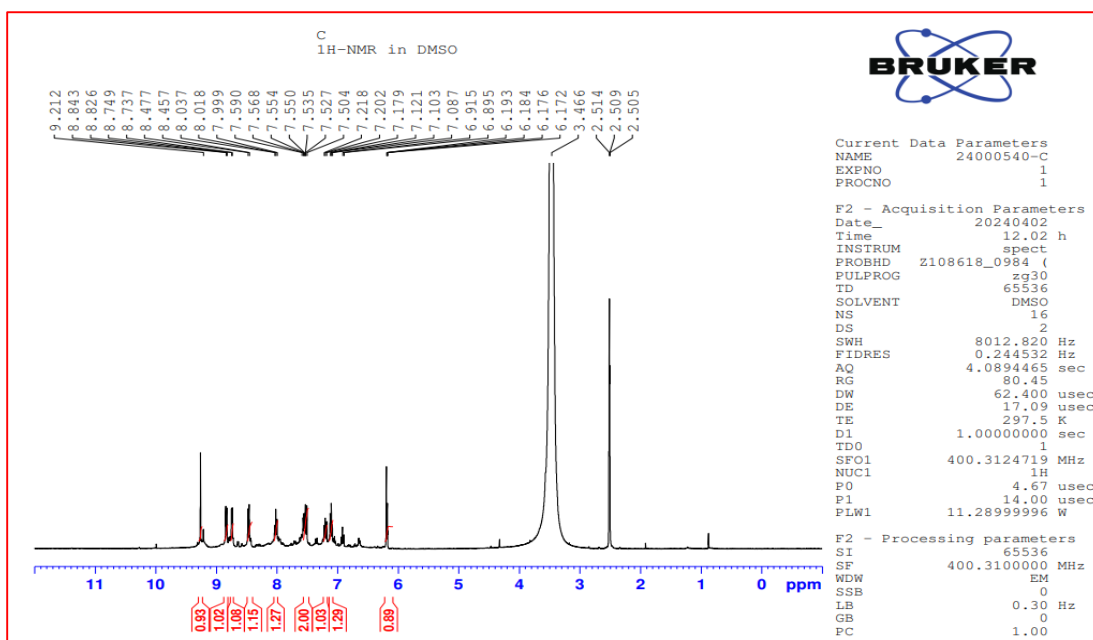
**Fig.S10** HR-MS profile of 2-Amino-4-(5-bromo-2-hydroxyphenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4b**)



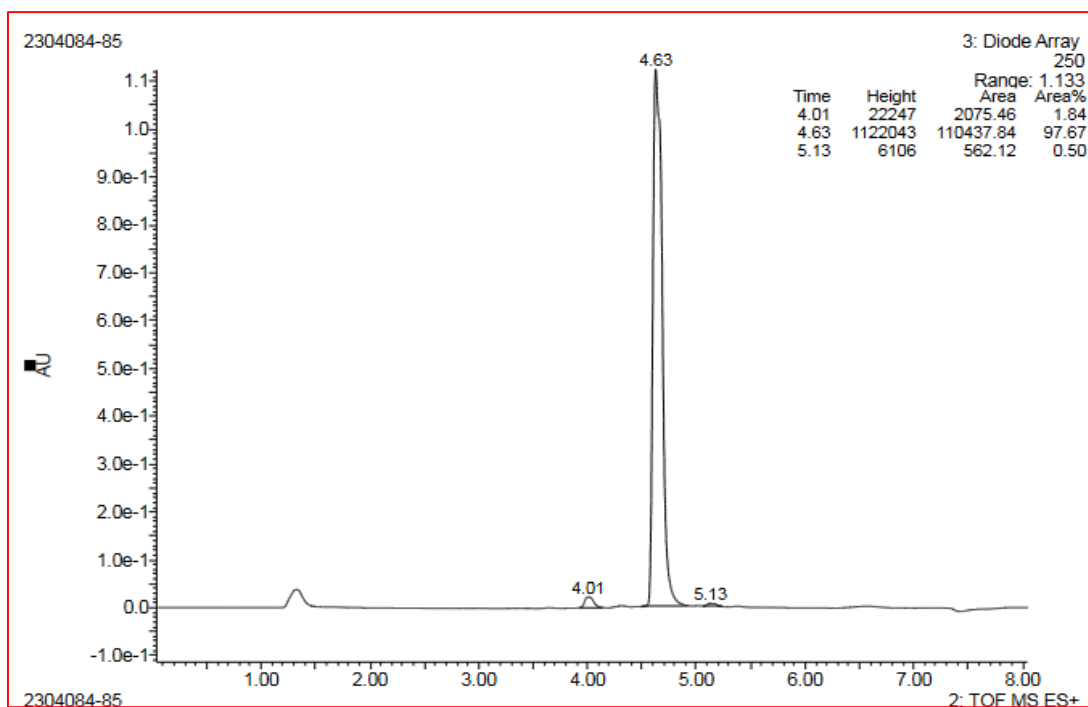
**Fig.S11** FT-IR spectrum of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)



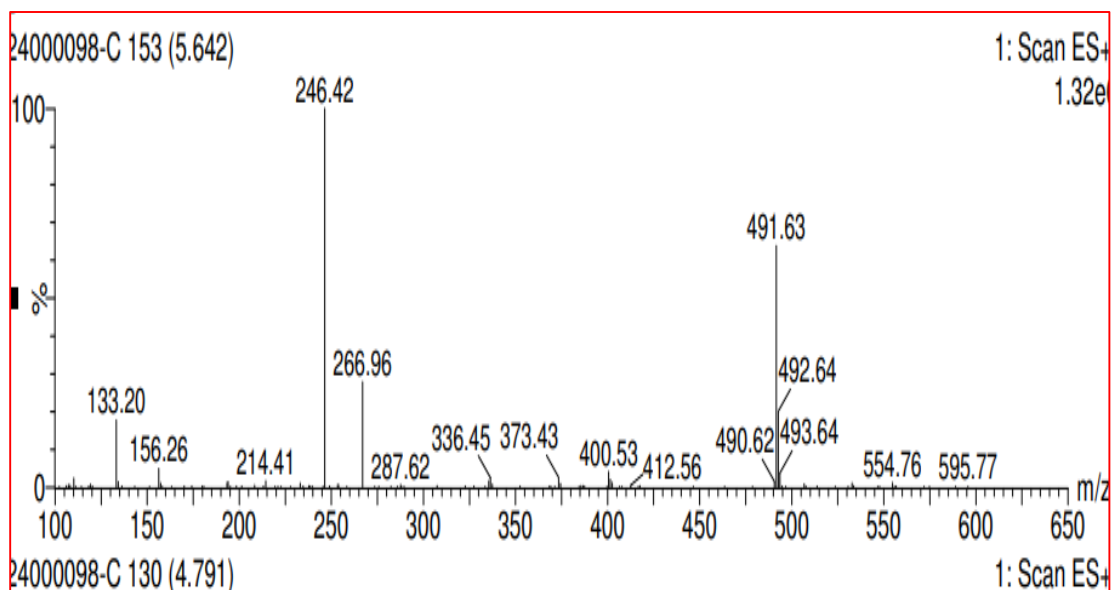
**Fig.12** <sup>13</sup>C-NMR spectrum of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)



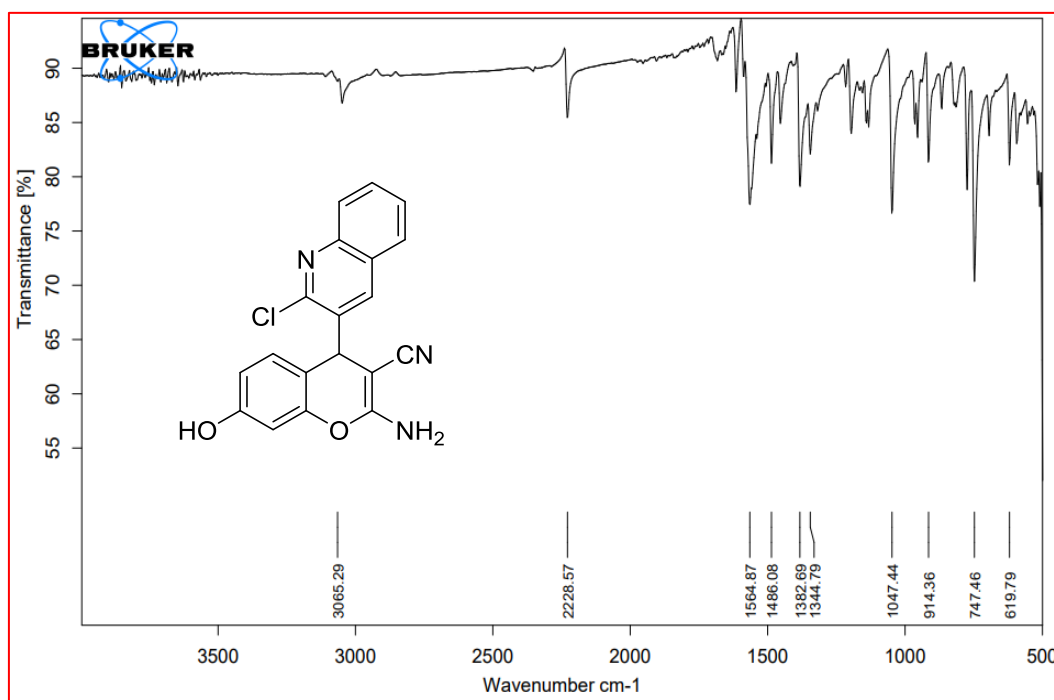
**Fig.S13**  $^1\text{H-NMR}$  spectrum of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)



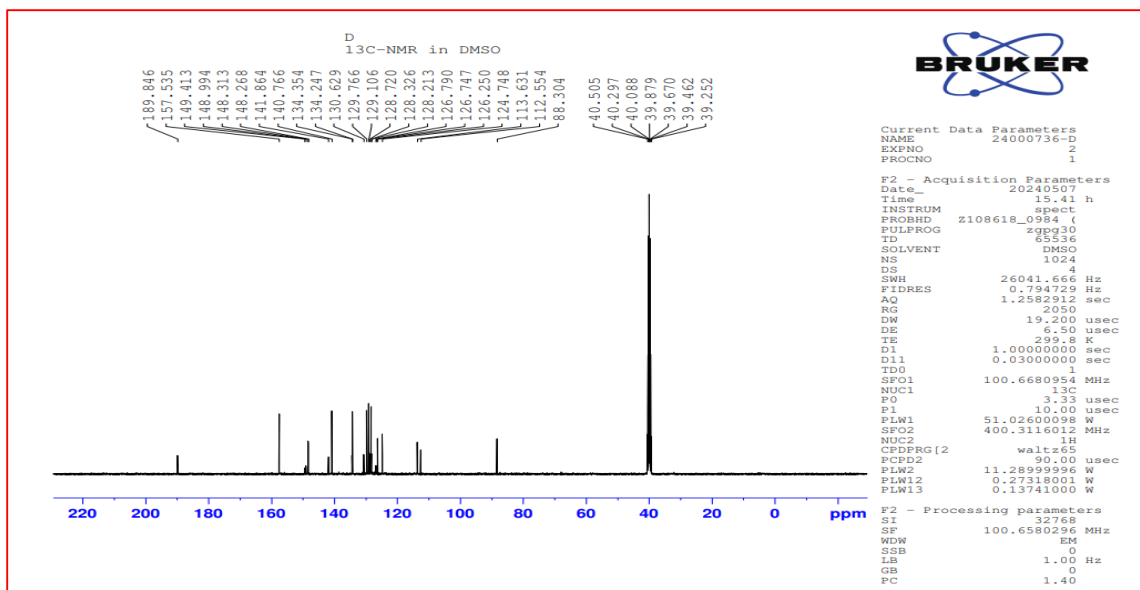
**Fig.S14** LC profile of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (**4c**)



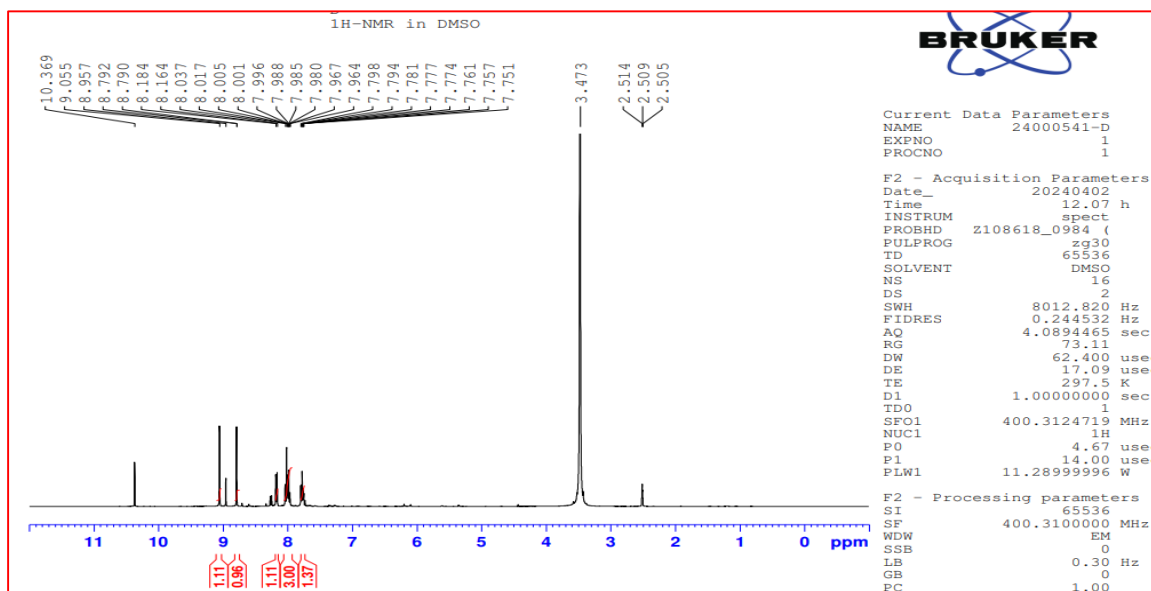
**Fig.S15** HR-MS profile of 2-Amino-7-hydroxy-4-(pyridine-2-yl)-4H-chromene-3-carbonitrile (4c)



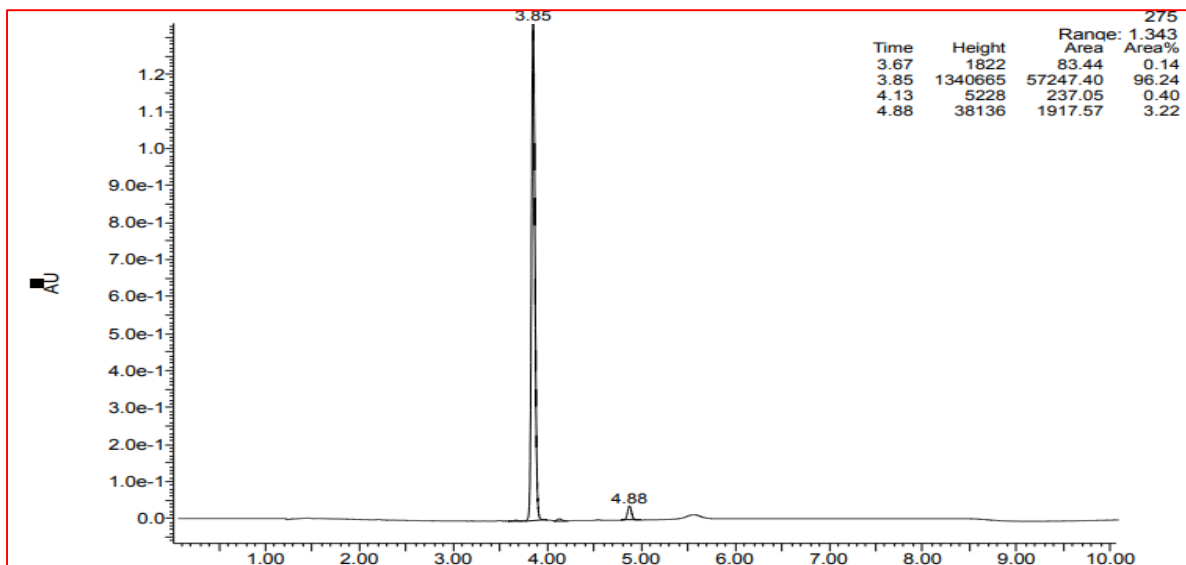
**Fig.S16** FT-IR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (4d)



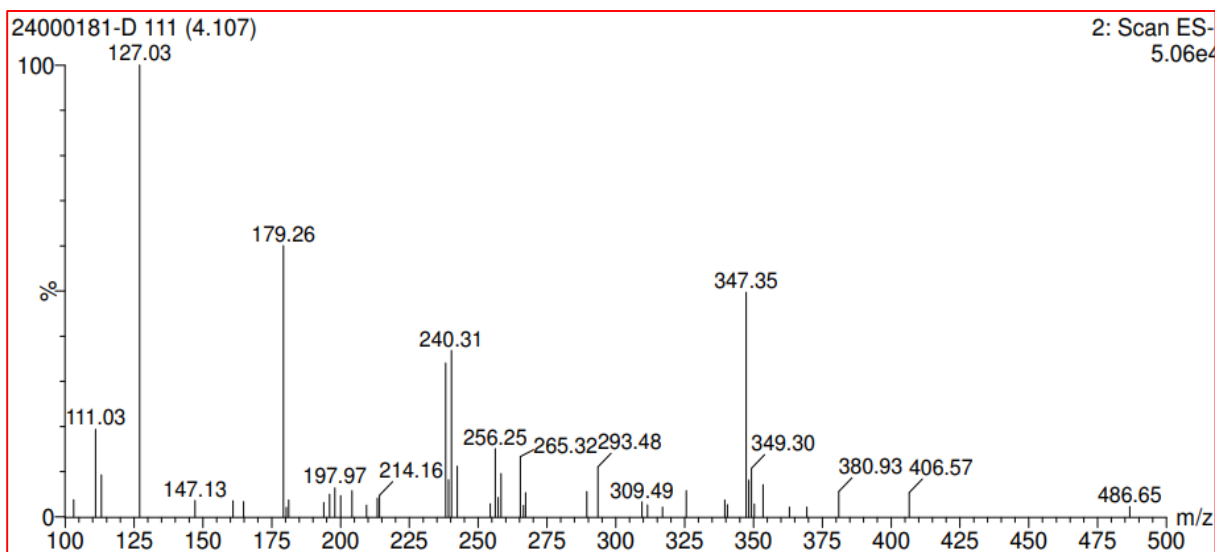
**Fig.S17**  $^{13}\text{C}$ -NMR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-Chromene-3- carbonitrile (**4d**)



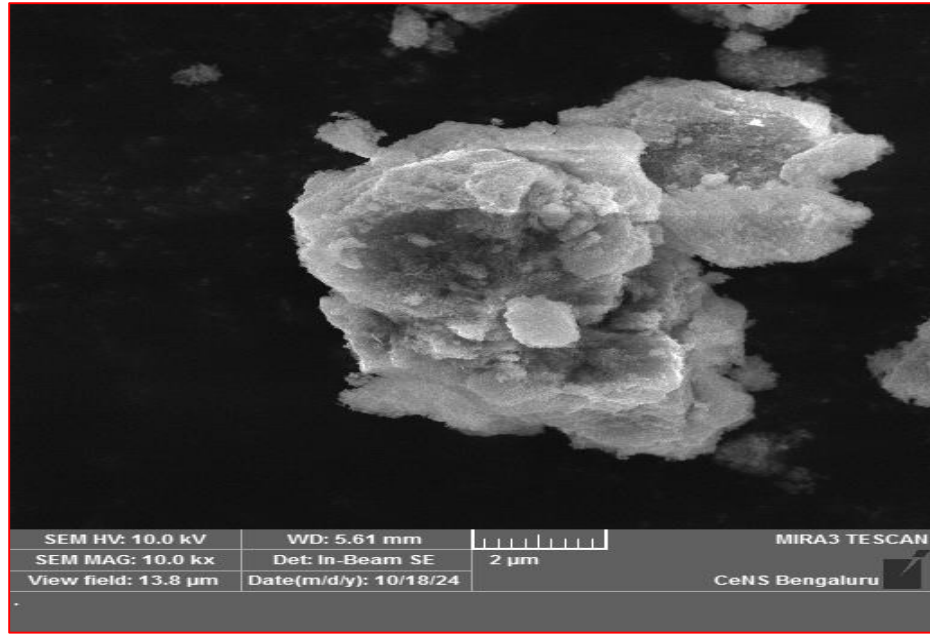
**Fig.S18**  $^1\text{H}$ -NMR spectrum of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-Chromene-3-carbonitrile (**4d**)



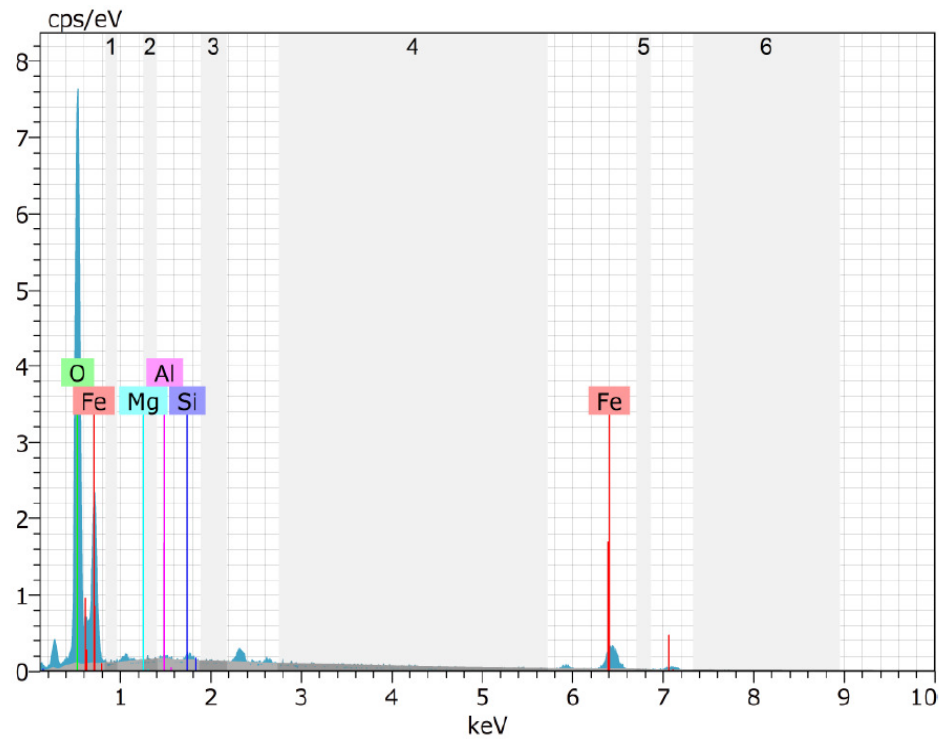
**Fig.S19** LC profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4d**)



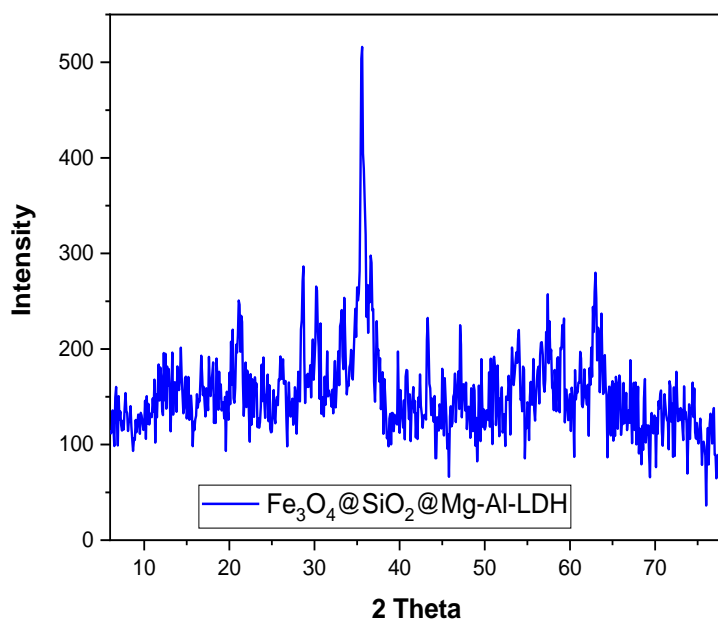
**Fig. S20** HR-MS profile of 2-Amino-4-(4-(dimethylamino) phenyl)-7-hydroxy-4H-chromene-3-carbonitrile (**4d**)



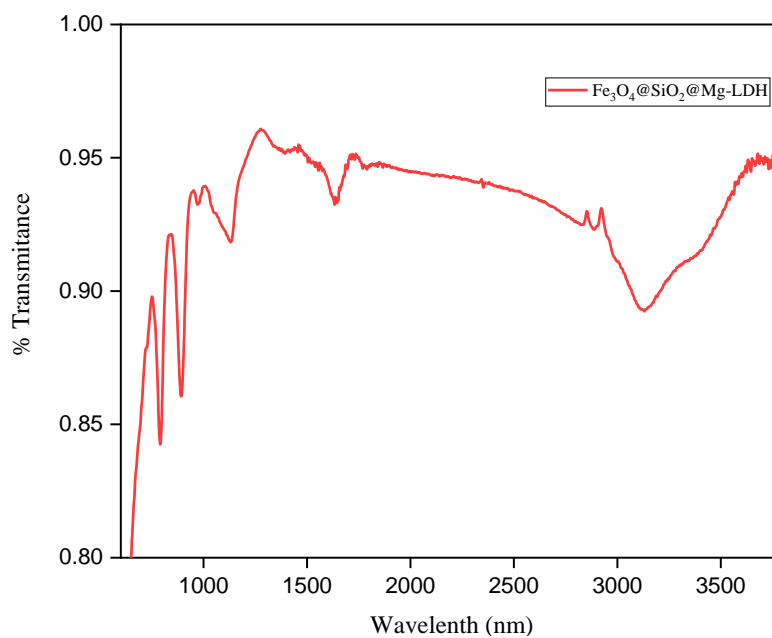
**Figure S21:** FE-SEM of recycled  $\text{Fe}_3\text{O}_4@SiO_2@Al\text{-Mg-LDH}$



**Figure S22:** EDS of recycled  $\text{Fe}_3\text{O}_4@SiO_2@Al\text{-Mg-LDH}$



**Figure S23:** XRD profile of Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>@Al-Mg-LDH



**Figure S24:** FT-IR of recycled Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>@Al-Mg-LDH