SUPPORTING INFORMATION

The effect of high external pressure on structure and stability of MOF α-$Mg_3(HCOO)_6$ probed by *in situ* Raman and FT-IR Spectroscopy

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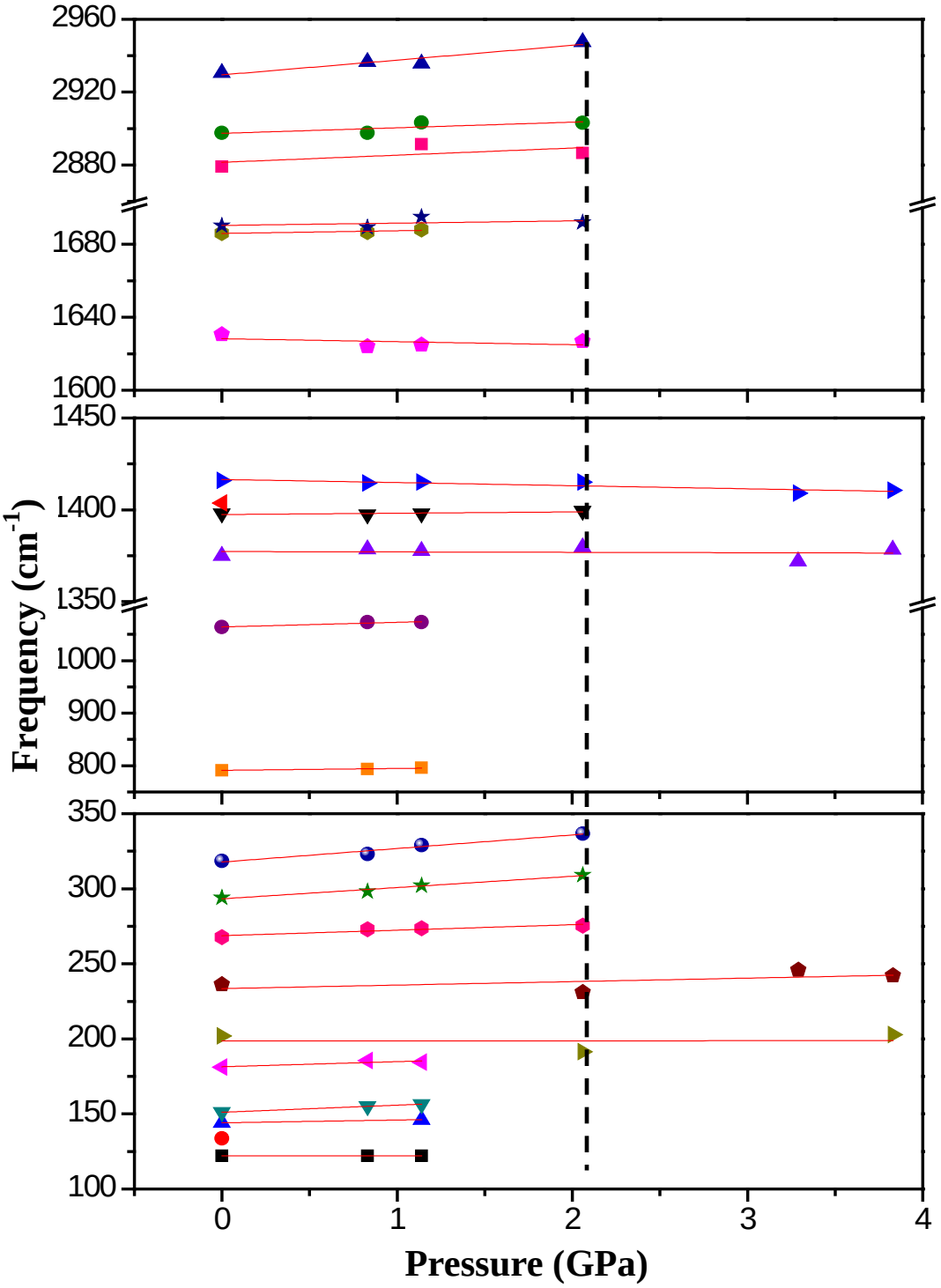

Figure S1 Pressure dependence of selected Raman modes of activated α-$Mg_3(HCOO)_6$ compression in the pressure region of 0-4GPa. The lines are based on linear least square fit. The vertical dashed line denotes the phase transition pressure of the framework.

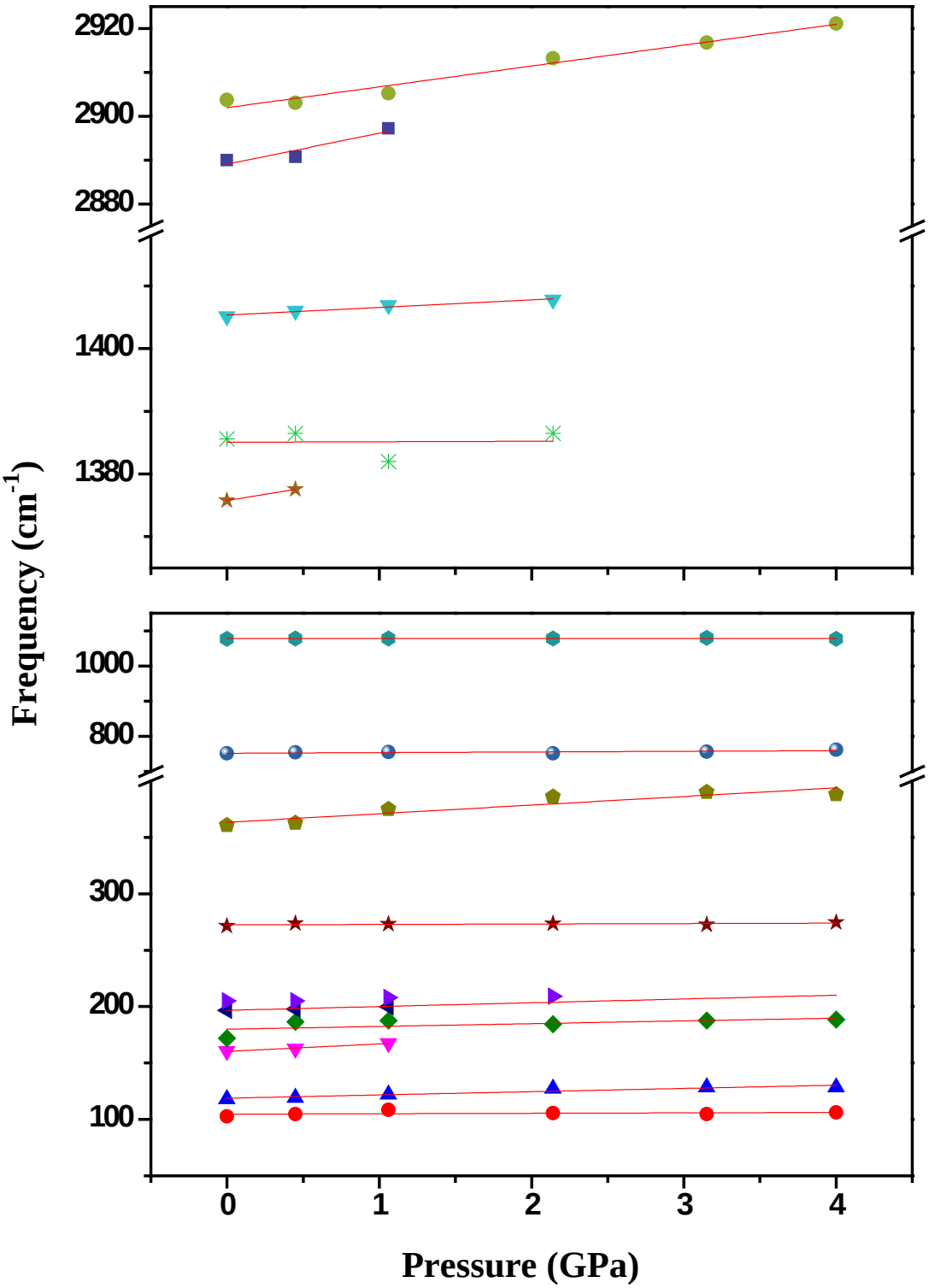

Figure S2 Pressure dependence of Raman modes of DMF loaded on α-$Mg_3(HCOO)_6$ on compression in the pressure region of 0-4 GPa. The lines are based on linear least square fit.

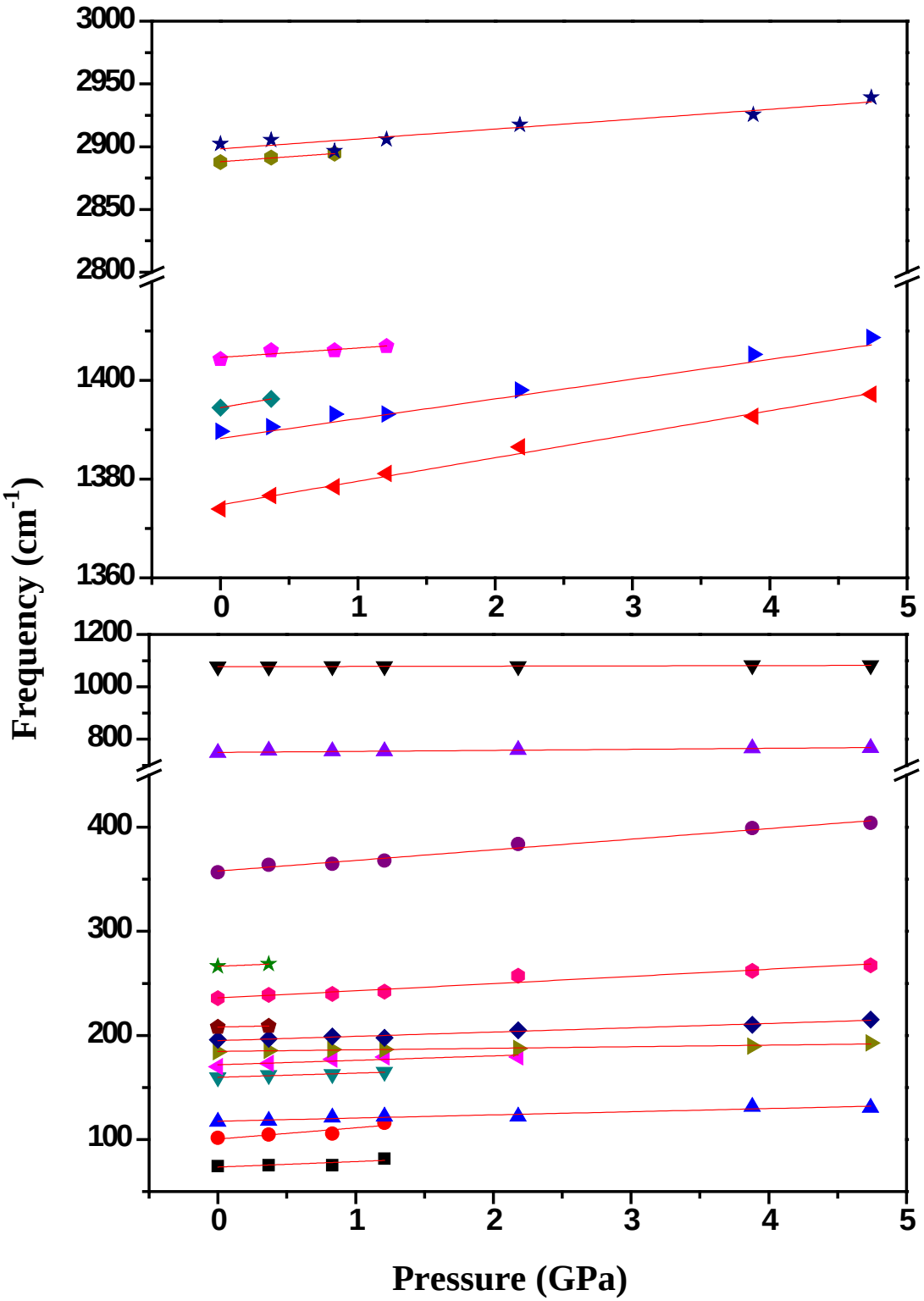

Figure S3 Pressure dependence of Raman modes of benzene loaded α-$Mg_3(HCOO)_6$ on compression in the pressure region of 0-5 GPa. The lines are based on linear least square fit.

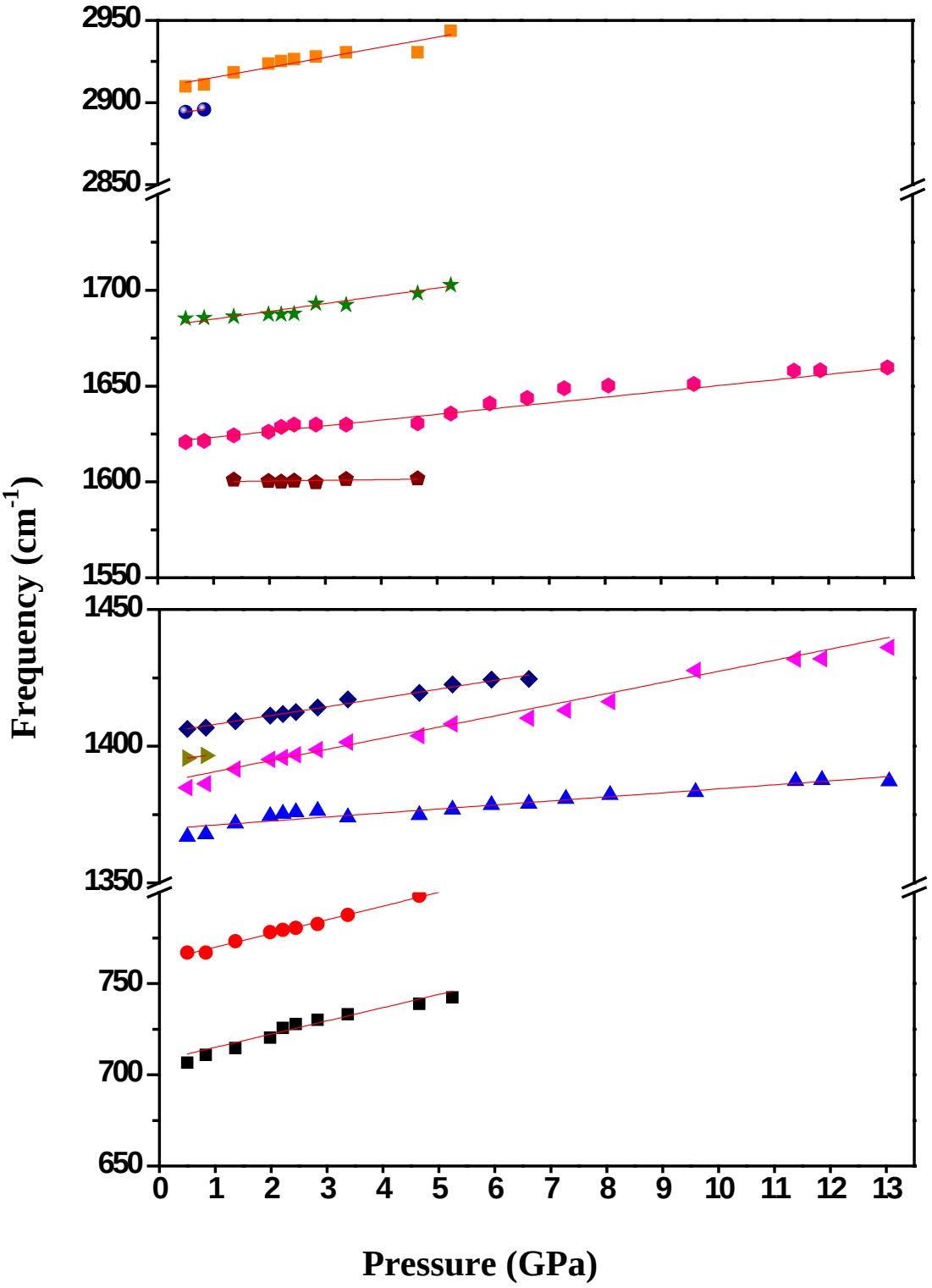

Figure S4 Pressure dependence of selected IR modes of activated α-$Mg_3(HCOO)_6$ on compression in the pressure region of 0-13GPa. The lines are based on linear least square fit.

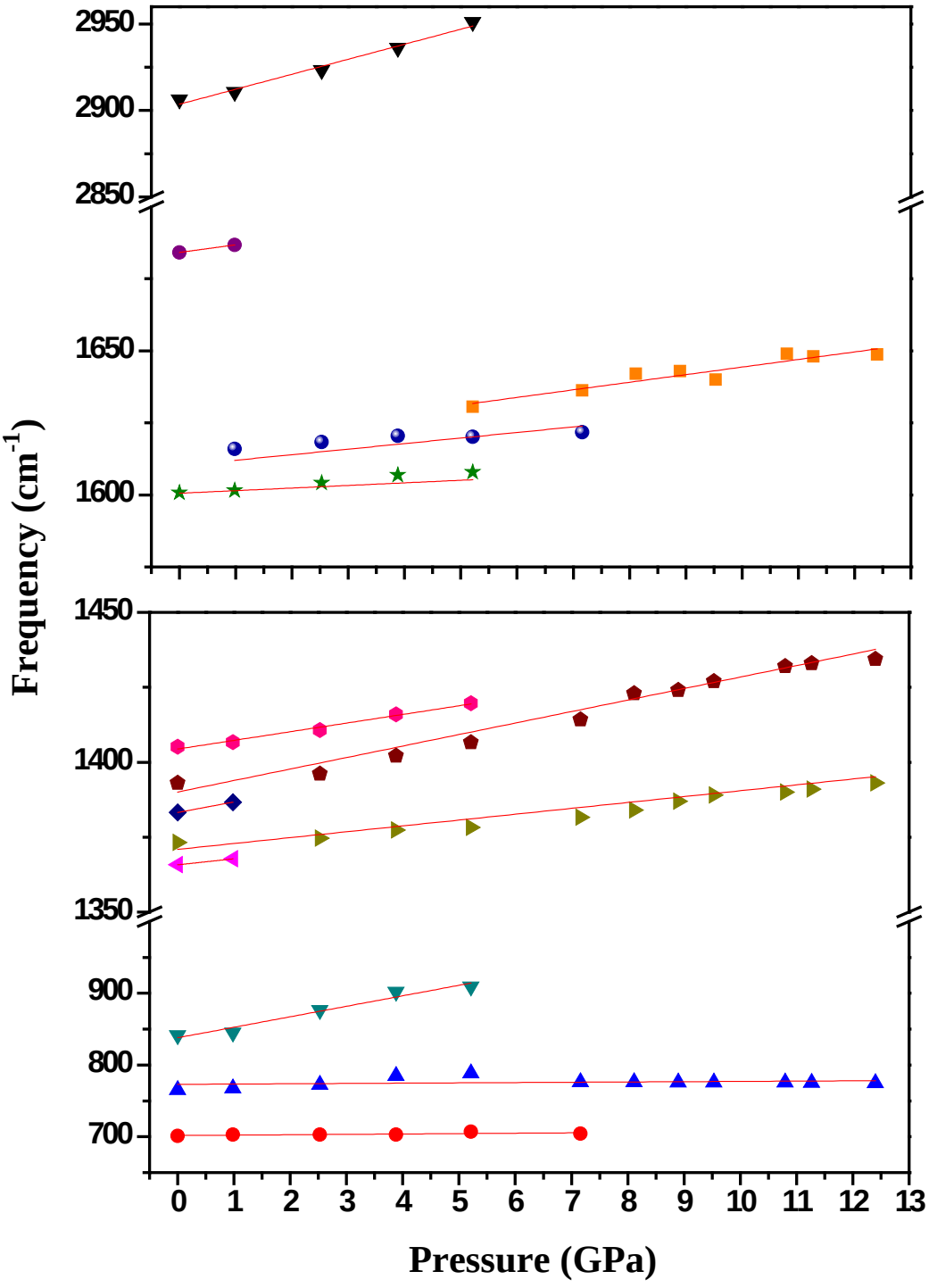

Figure S5 Pressure dependence of selected IR modes of DMF loaded α-$Mg_3(HCOO)_6$ on compression in the pressure region of 0-13GPa. The lines are based on linear least square fit.

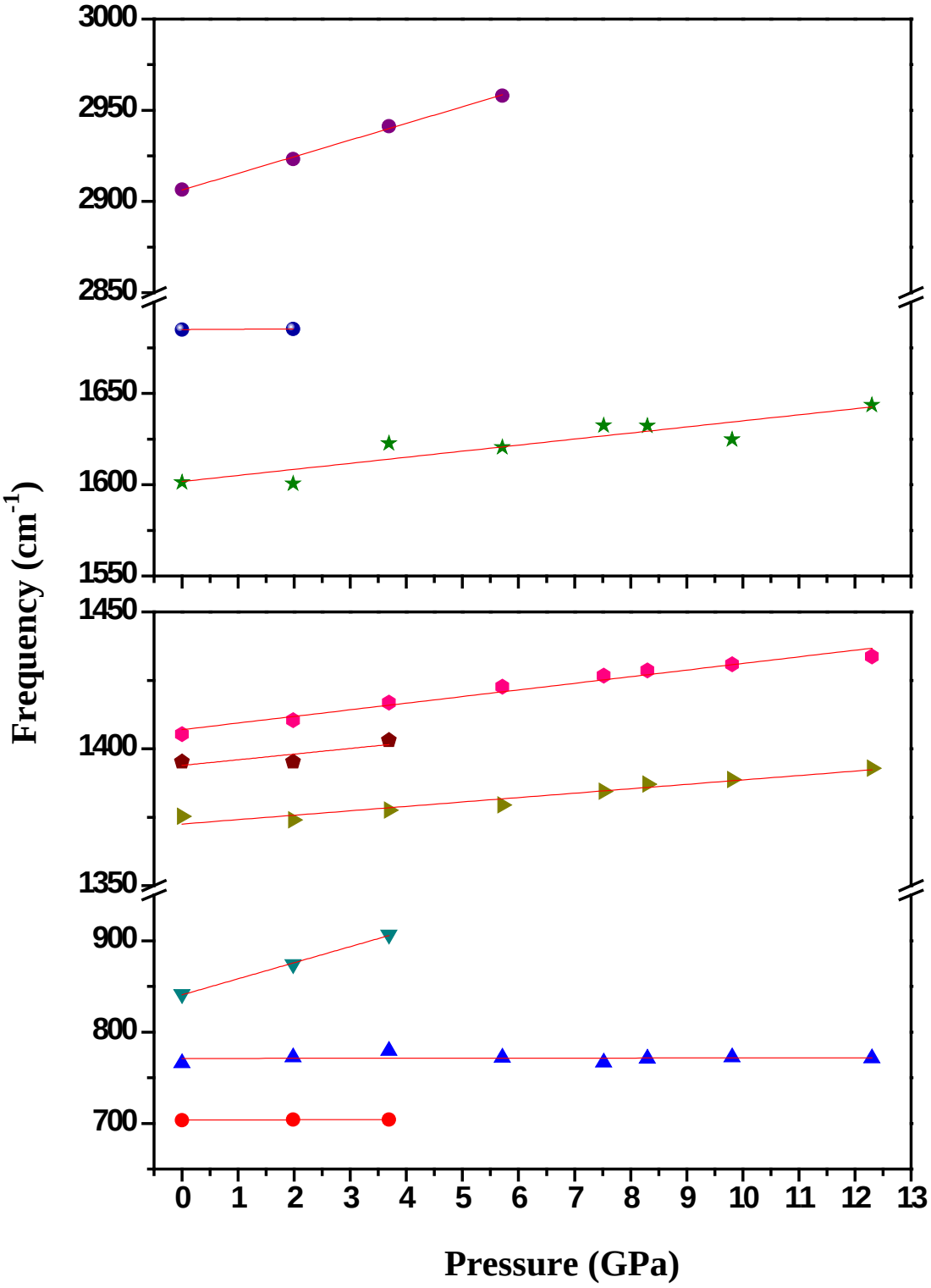

Figure S6 Pressure dependence of IR modes of benzene loaded α-$Mg_3(HCOO)_6$ on compression in the pressure region of 0-13GPa. The lines are based on linear least square fit.