Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information:

A simple and Novel protocol for Li-trapping of POM/MOF nano-composite as a new adsorbent for CO_2 uptake

Mahboube Ghahramaninezhad[1], Bita Soleimani[1], Mahdi Niknam Shahrak[1*]

[1]Department of Chemical Engineering, Quchan University of Technology, Quchan, Iran

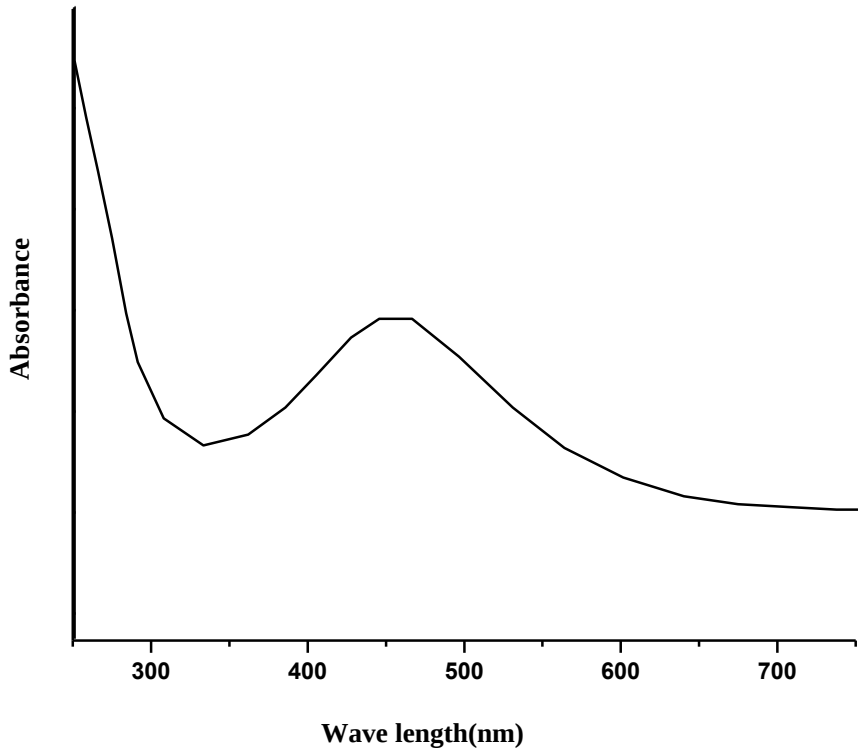

Fig. S1. UV-Vis spectrum of the synthesized $\{Mo_{132}\}$

* Corresponding Author: M. Niknam.sh@qiet.ac.ir, +98 51 4734 4001, +98 915 803 4564

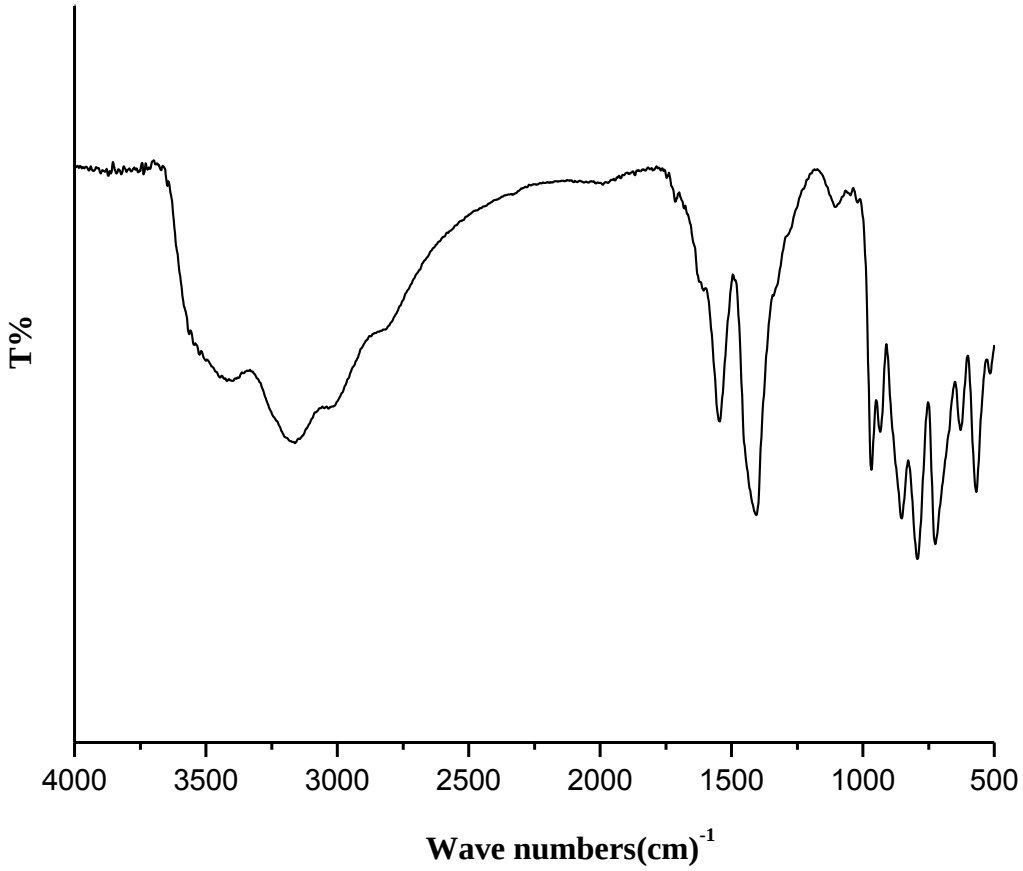

Fig. S2. FT-IR spectra of the synthesized {Mo_{132}}

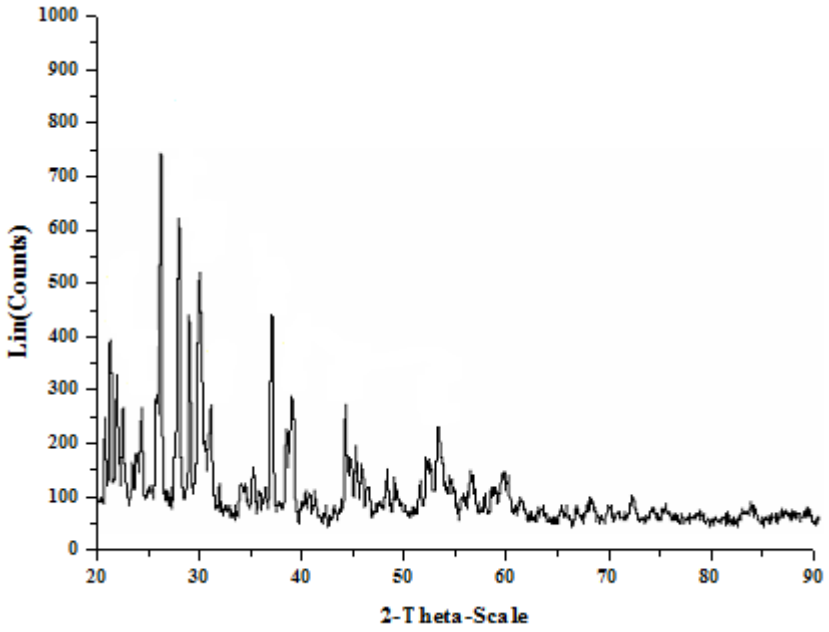

Fig. S3. XRD pattern of the synthesized {Mo_{132}}

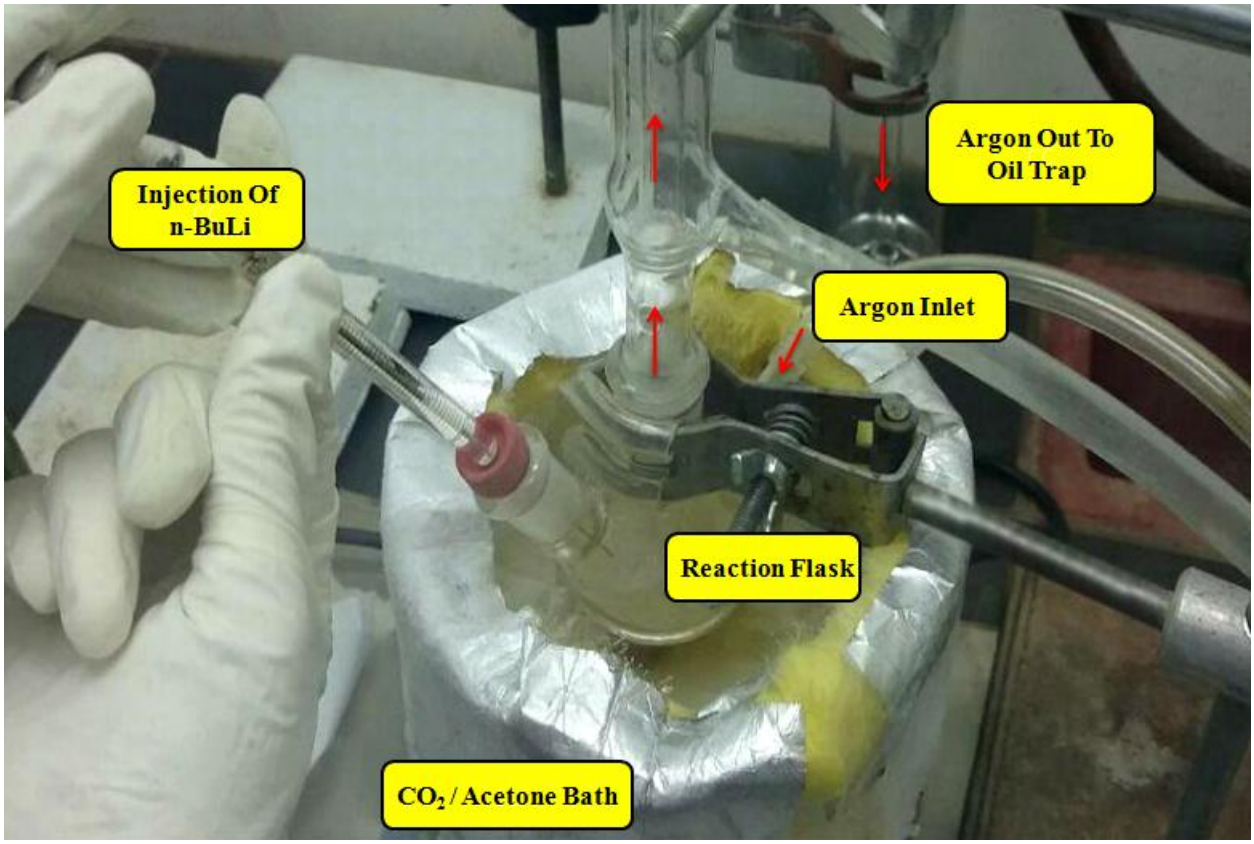

Fig. S4. Experimental equipments used for ZIF-8@{Mo_{132}}@Li^+ nano-composite synthesis

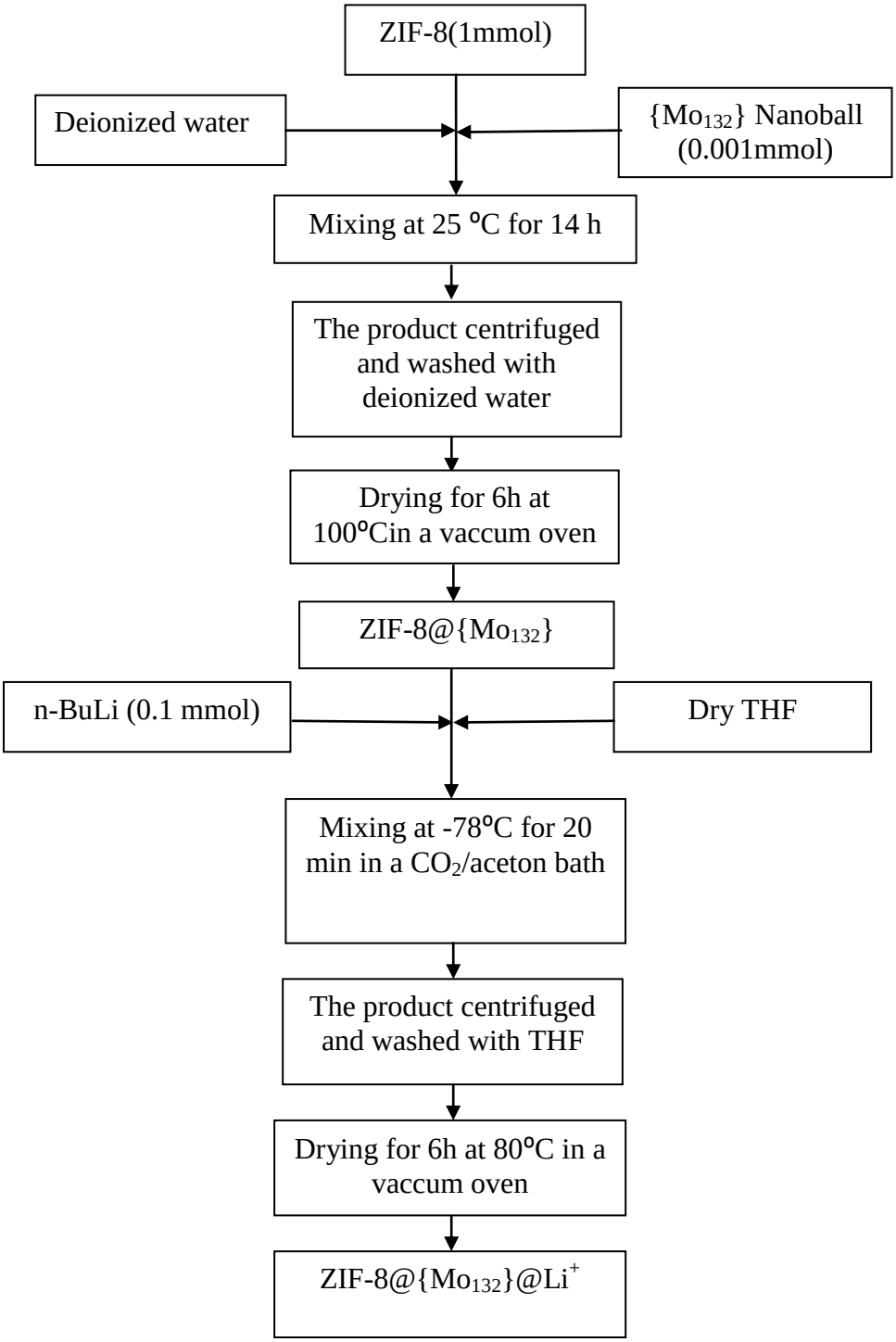

Fig. S5. The flow chart for preparation of ZIF-8@{Mo_{132}}@Li^+ nano-composite

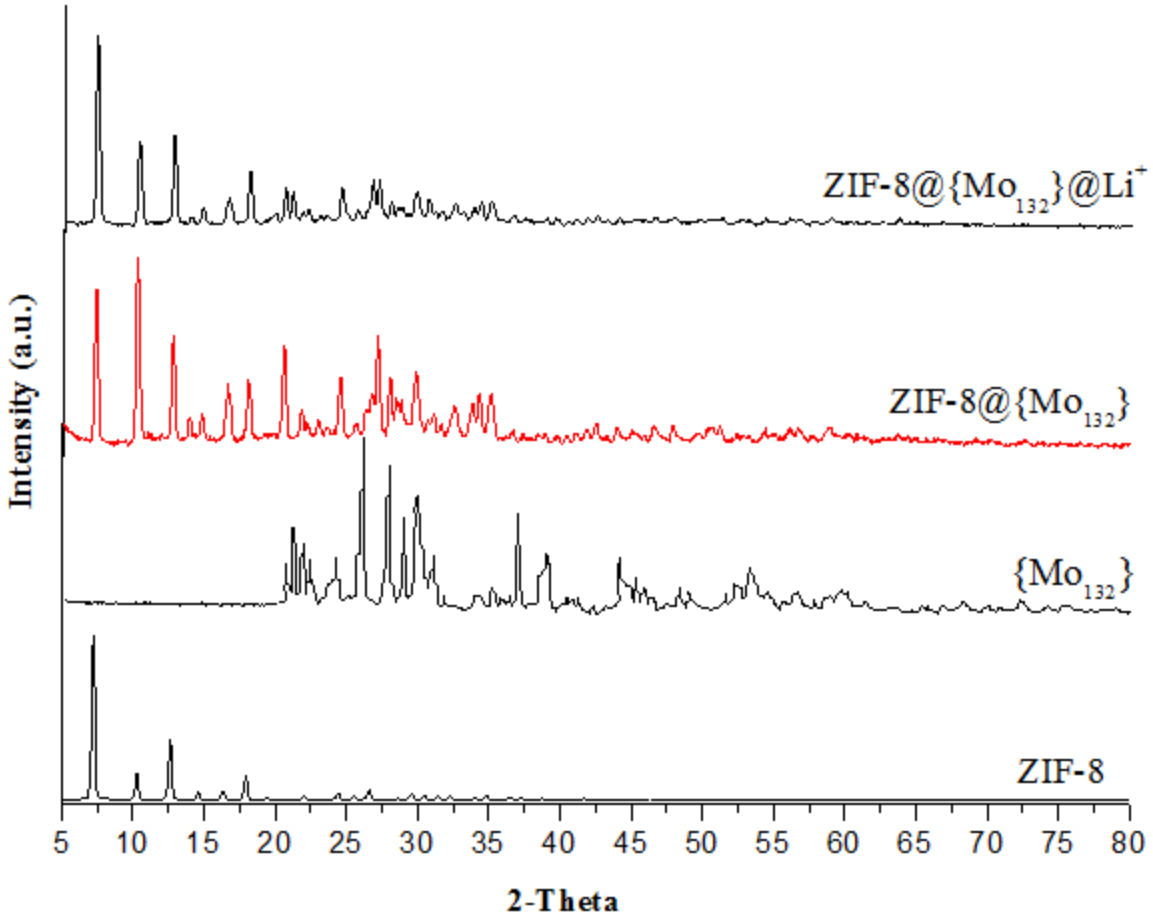

Fig. S6. XRD patterns of ZIF-8, {Mo32}, ZIF-8@{Mo_{132}} and ZIF-8@{Mo_{132}}@Li^+ nano-composite

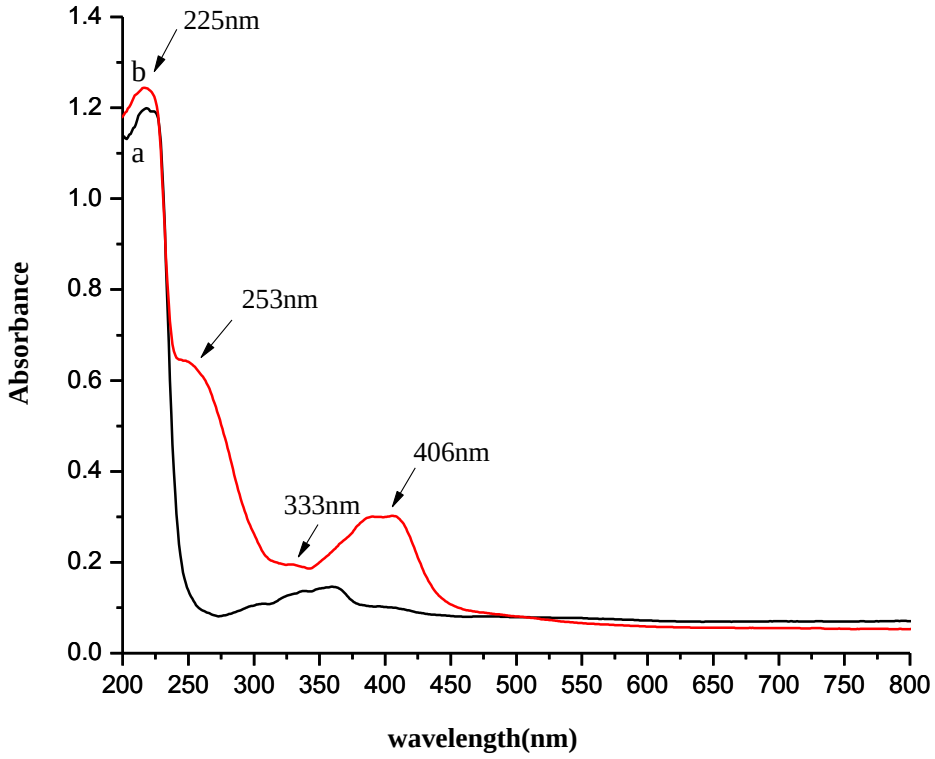

Fig. S7. UV-Vis-spectra of (**a**) ZIF-8 and (**b**) ZIF-8@{Mo_{132}} nano-composite

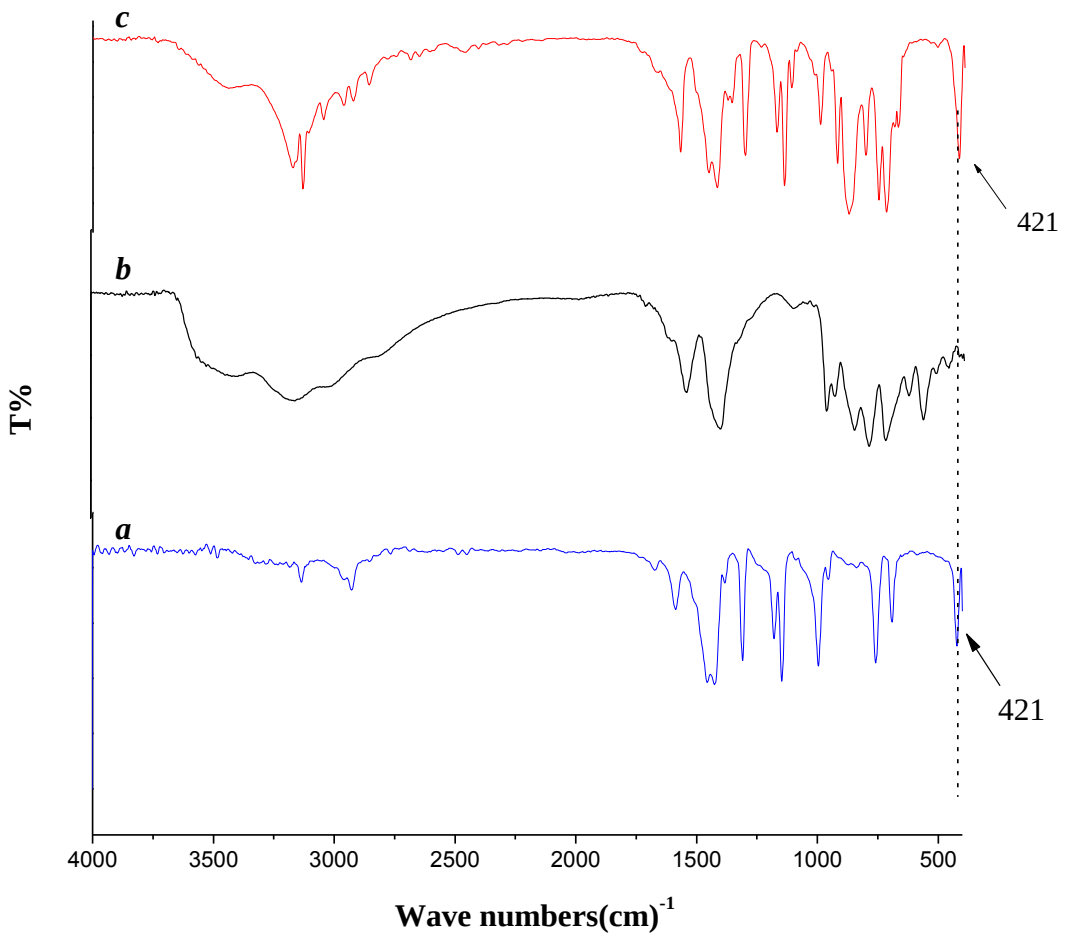

Fig. S8. FT-IR spectra of (**a**) ZIF-8(**b**) {Mo_{132}} (**c**) ZIF-8@{Mo_{132}}

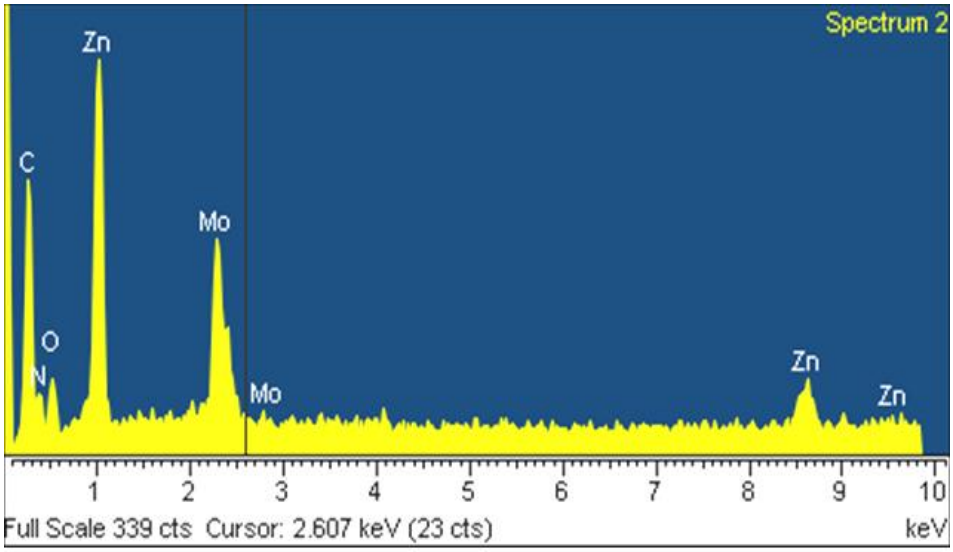

Fig. S9. EDX analysis of the ZIF-8@{Mo_{132}} nano-composite

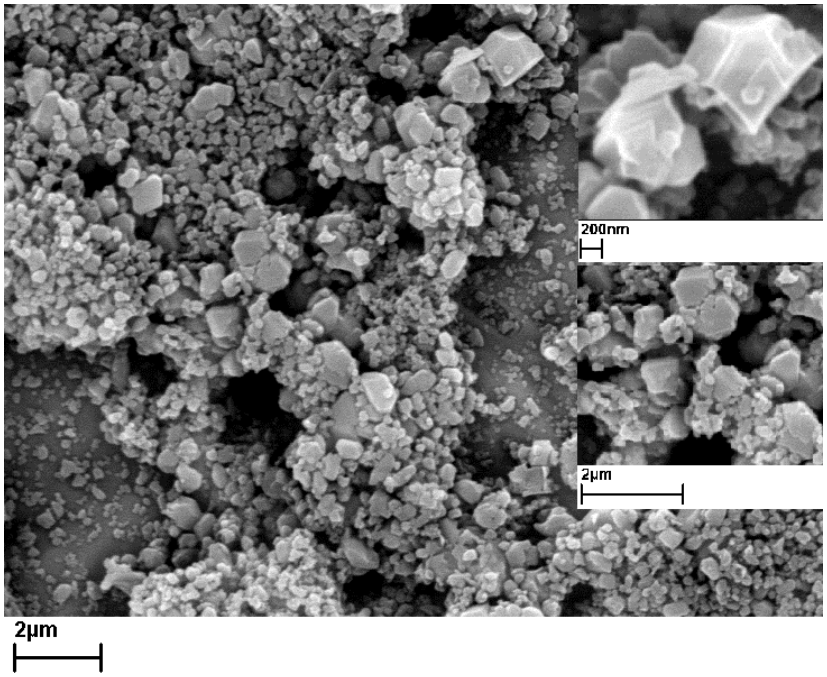

Fig. S10. SEM images of ZIF-8

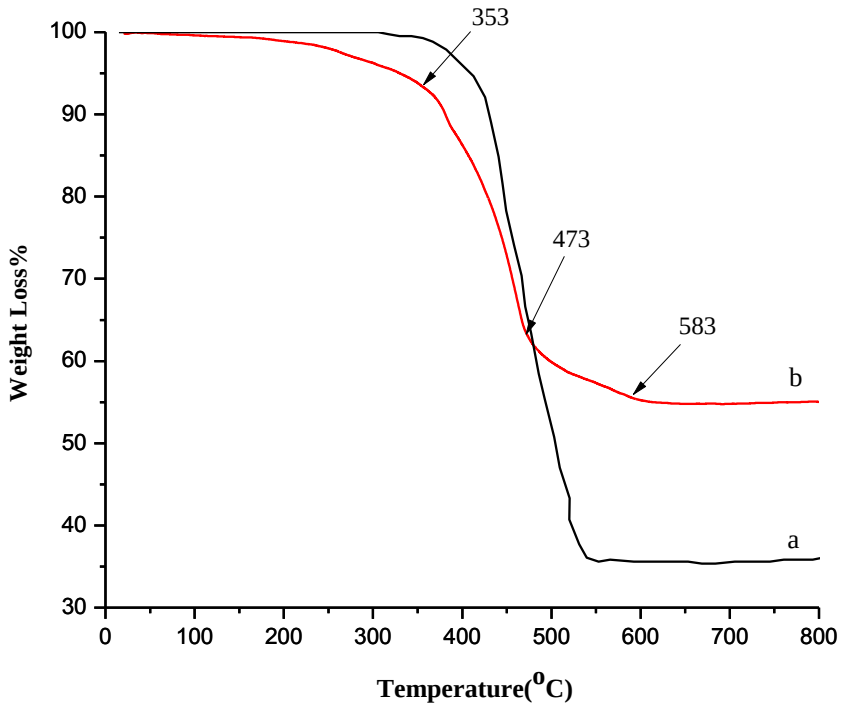

Fig. S11. TGA curve (**a**) of the ZIF-8 (**b**) as-synthesized ZIF-8@{Mo_{132}} nano-composite

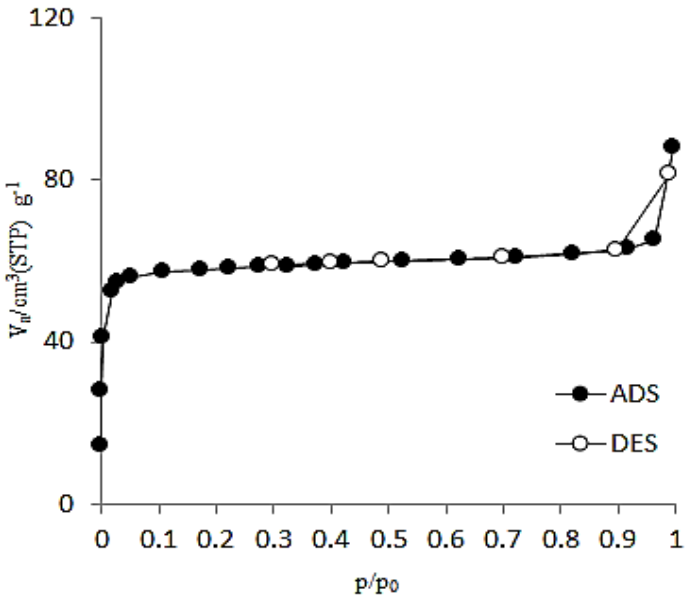

Fig. S12. The N_2 adsorption-desorption isotherms for ZIF-8@{Mo_{132}} nano-composite at 77K.

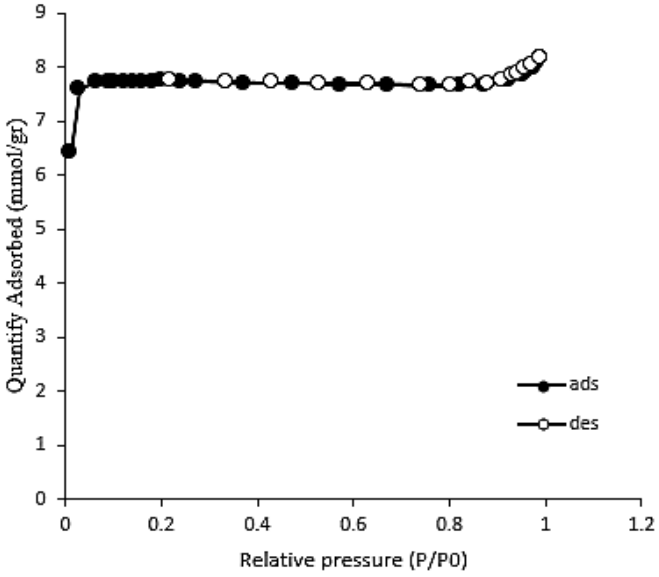

Fig. S13. The N_2 adsorption-desorption isotherms for ZIF-8@{Mo_{132}}@Li^+ nano-composite at 77K.

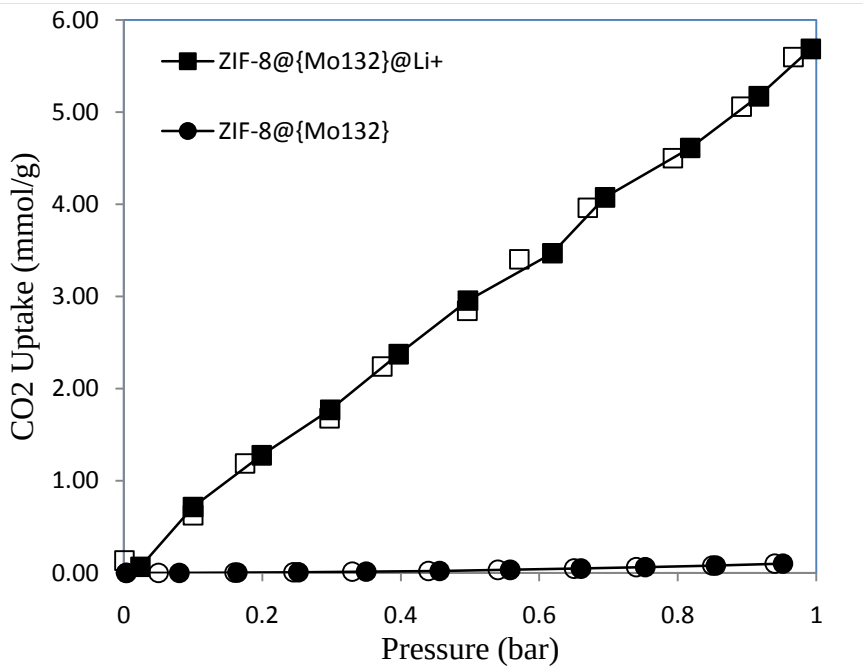

Fig. S14. The CO_2 adsorption-desorption isotherms for ZIF-8@{Mo_{132}}@Li^+ nano-composite in comparison with ZIF-8@{Mo_{132}} intermediate composite at 298K.

Table S1. The ICP analysis performance of ZIF-8@{Mo132}@Li+ nano-composite to obtain the actual content of Li+ in the structure

SPECTRO

		Printing Date:	07/02/2018 12:08:26
		Current User:	spectro
Method Name:	30MULTIELEMENT METHO	Creation Date:	2018-01-24 09:27:49
Method Autor:	spectro	Last Change:	2018-02-07 12:07:40

Sample Name: ZIF-8@{Mo132}@Li+				Sample Type: ZIF-8@{Mo132}@Li+		
Measure Date: 2018-02-07 11:4	Recalc. Date: 2018-02-07 12	State: Recalculated	Quality: Recalc | Driftec	Total Dilution: 10.000000		
Sample Identification						
Sample Name	DILUTION	VOLUME	WEIGHT			
sample-1:10	10.000000	20	0.029			

	Li.						
Conc 1	6460.94[ppm]						
Conc 2	6490.51[ppm]						
Conc MinRange	---						
Conc Mean	**6475.72[ppm]**						
Conc MaxRange	---						
Reported	**6475.72[ppm]**						

Table S2. The ICP analysis performance of ZIF-8@{Mo132}@Li+ nano-composite to obtain the actual content of $\{Mo_{132}\}$ in the structure

SPECTRO

		Printing Date:	07/02/2018 08:02:34
		Current User:	spectro
Method Name:	30MULTIELEMENT METHO	Creation Date:	2018-01-24 09:27:49
Method Autor:	spectro	Last Change:	2018-02-07 08:02:18

Sample Name: ZIF-8@{Mo132}@Li+				Sample Type: ZIF-8@{Mo132}@Li+		
Measure Date: 2018-02-06 14:3	Recalc. Date: 2018-02-07 08	State: Recalculated	Quality: Recalc | Driftec	Total Dilution: 100.000000		
Sample Identification						
Sample Name	DILUTION	VOLUME	WEIGHT			
SAMPLE MS NIKN	100.000000	1	0.029			

	Mo..						
Conc 1	35398.9[ppm]						
Conc 2	34446.9[ppm]						
Conc MinRange	---						
Conc Mean	**34922.9[ppm]**						
Conc MaxRange	---						
Reported	**34922.9[ppm]**						

Table S3. Textural properties of as-synthesized ZIF-8@{Mo_{132}} and ZIF-8@{Mo_{132}}@Li^+ composites

Sample	BET surface area (m^2/g)	Langmuir surface area (m^2/g)	Average pore size* (°A)	Pore volume** (cc/g)
ZIF-8@{Mo_{132}}	591	777	19.4	0.29
ZIF-8@{Mo_{132}}@Li^+	237	312	21.9	0.13

* Calculated by BET (4V/A)

**Calculated at P/P_0= 0.99