processes

Supplementary Materials: Study of Amine Functionalized Mesoporous Carbon as CO_2 Storage Materials

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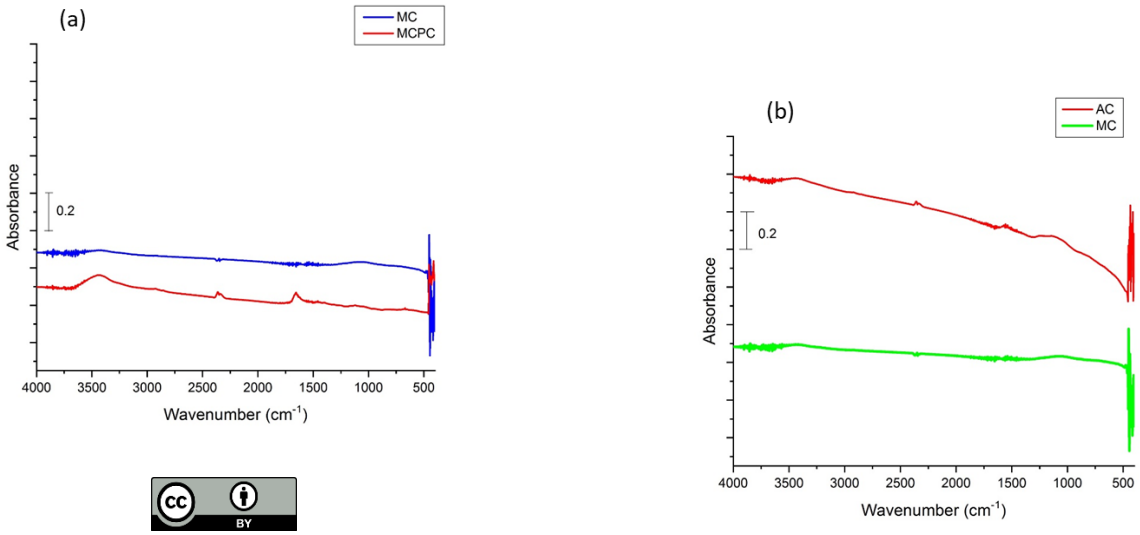
1. FTIR

The FTIR spectra of mesoporous carbon before carbonization process (MC-PC) compared to as-synthesized mesoporous carbon (MC) are shown in Figure 1a. The broad band in the range of 3250-3500 cm^{-1} is assigned to O-H stretching vibration of phloroglucinol [33]. The weak band at ~2923 cm^{-1} corresponds to symmetric and asymmetric C-H stretching vibrations that come from a bonding between formaldehyde and phloroglucinol [1]. After carbonization process, these bands disappeared, showing the complete removal of most of oxygen and hydrogen atoms of the precursors, Figure 1b.



(**a**) (**b**)

Figure S1. FT-IR spectra of MC (a) before (red) and after carbonization (blue); (b) MC (brown) and AC (green).

2.% Loading of Amine Compounds in Mesoporous Carbon and Activated Carbon

The %loading of amine compound was determined from EDX measurement, based on the wt% of N, and calculated using equation 1.

Example:

MCEDA49

Table S1. EDX for MCEDA49.

Materials	wt%		
	C	N	O
MC-EDA49	56.11	23.23	20.66

Calculation:

$$\%\text{loading} = \frac{\text{Mr EDA}}{2 \times \text{Ar N}} \times \text{Wt\% N} = \frac{60\ \text{g/mol}}{2 \times 14\ \text{g/mol}} \times 23.23\% = 49\% \quad (1)$$

Using similar calculation, we summarized the list of MC and AC derivatives in Table S2 below:

Table S2. Name of adsorbent materials

Materials	**Amine loading**		**Name of adsorbent**
	Target	**Real**	
MC/EDA	50	49	MCEDA49
MC/TETA	50	52	MCTETA52
AC/TETA	30	14	ACTETA14
AC/TETA	50	21	ACTETA21