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Supporting Information

Tailoring Activated Carbons for Efficient Downstream Processing: Selective Liquid-Phase Adsorption of Lysine

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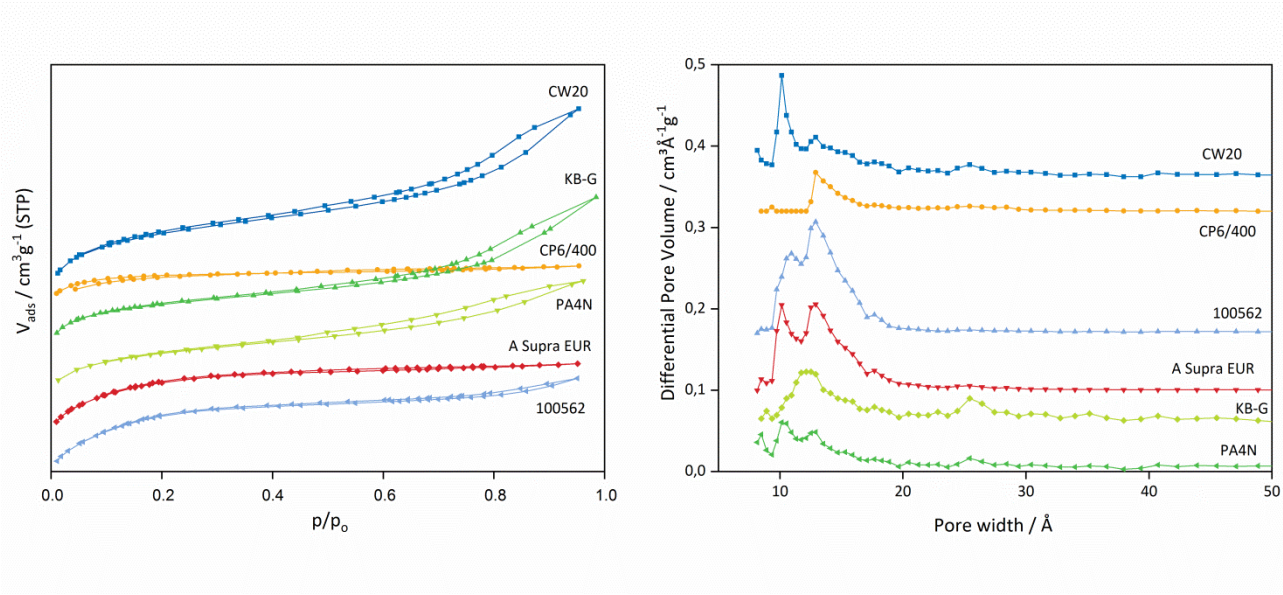

Figure S 1. Nitrogen physisorption adsorption-desorption isotherms (offset: 200 cm^3g^{-1}). (b) DFT pore size distributions (offset: 0.1 $cm^3A^{-1}g^{-1}$).

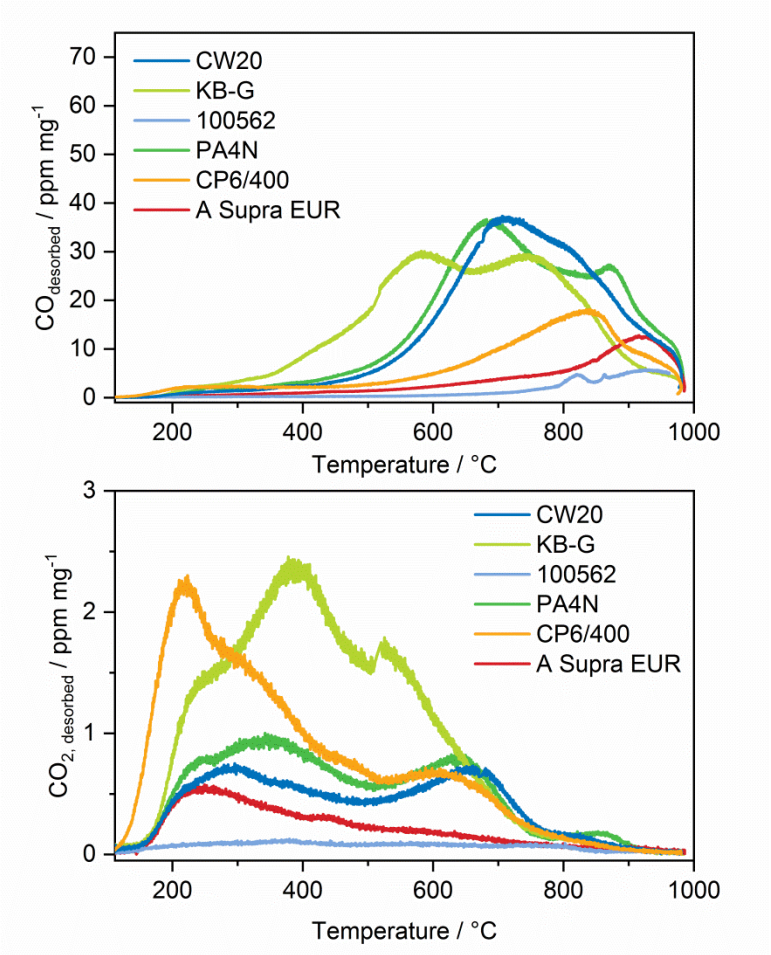

Figure S 2 Rates of CO and CO_2 released during TPD-MS analysis of the activated carbons.

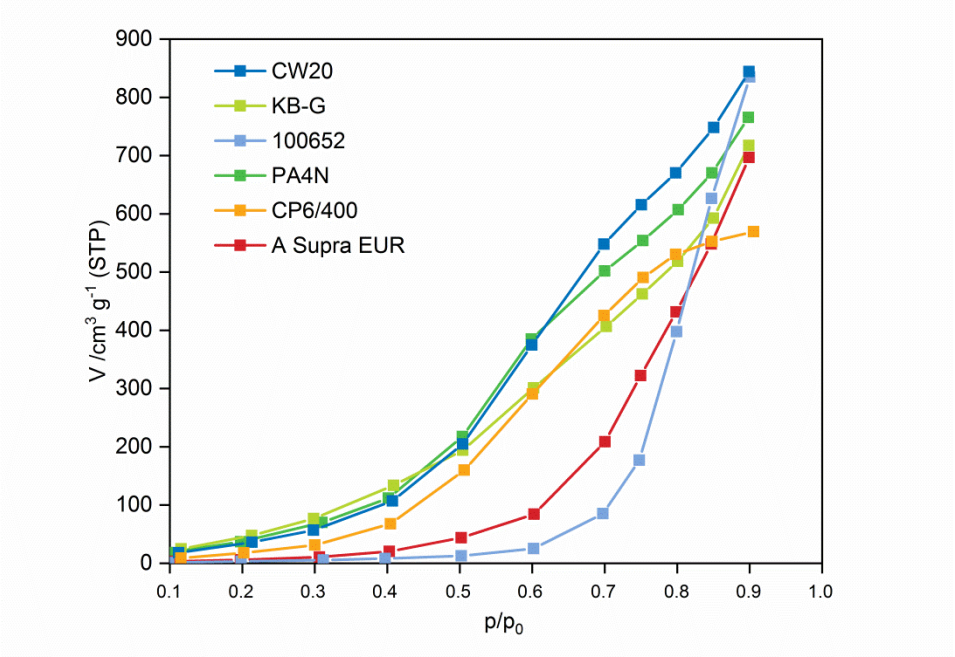

Figure S 3 Water vapor adsorption isotherms of the activated carbons at 30 °C.

Table S 1 Activated carbon surface functionalities obtained by Boehm titration.

	Carbon surface functionalities (µmol g^{-1})		
Activated Carbon	Phenolic	Lactonic	Carboxylic
CW20	317	171	143
KB-G	275	564	261
PA 4N	112	52	483
CP 6/400	142	15	383
A Supra EUR	198	61	37
Blü 100562	85	38	85

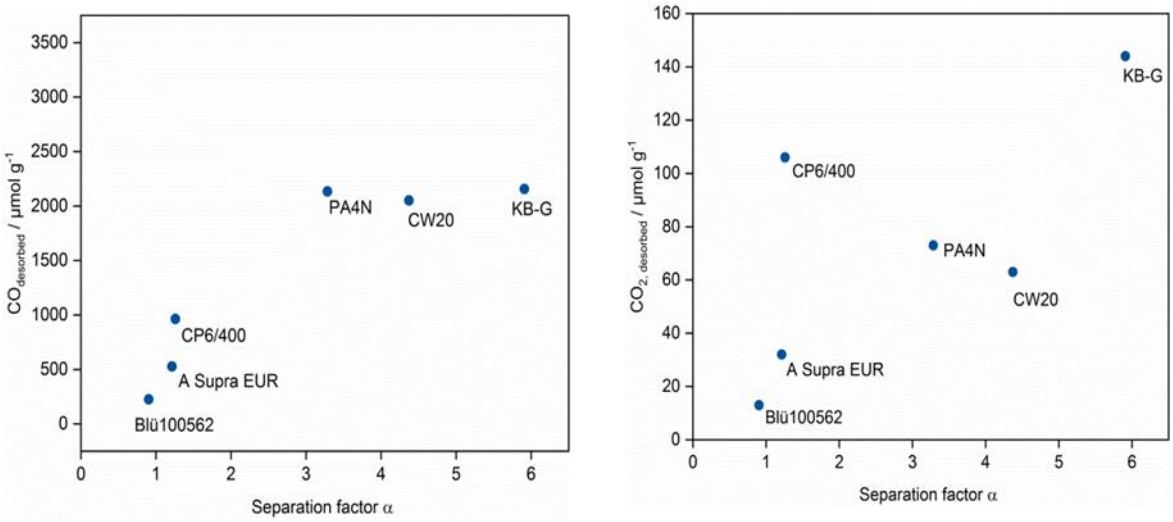

Figure S 4 Separation factor as a function of CO (left) and CO2 (right) released during TPD-MS analysis for activated carbons.

Table S 2 Results of textural properties for modified Silcarbon CW20 and amounts of CO, CO_2 released obtained by TPD-MS.

	Textural properties			Desorption (µmol g^{-1})$_c$	
Activated Carbon	S_{total} (m^2 g^{-1})^a	V_{total} (cm^3 g^{-1})	V_{micro} (cm^3 g^{-1})^b	CO	CO_2
CW20	2023	1.83	0.49	2052	63
CW20 ox. 4M HNO_3	1196	0.87	0.31	4217	522
CW20 red. 300 °C	1713	1.73	0.41	1660	43
CW20 red. 500 °C	1406	1.28	0.34	838	20

[a] BET Method, [b] t-plot method, [c] amounts of CO, CO_2 released obtained by TPD-MS.

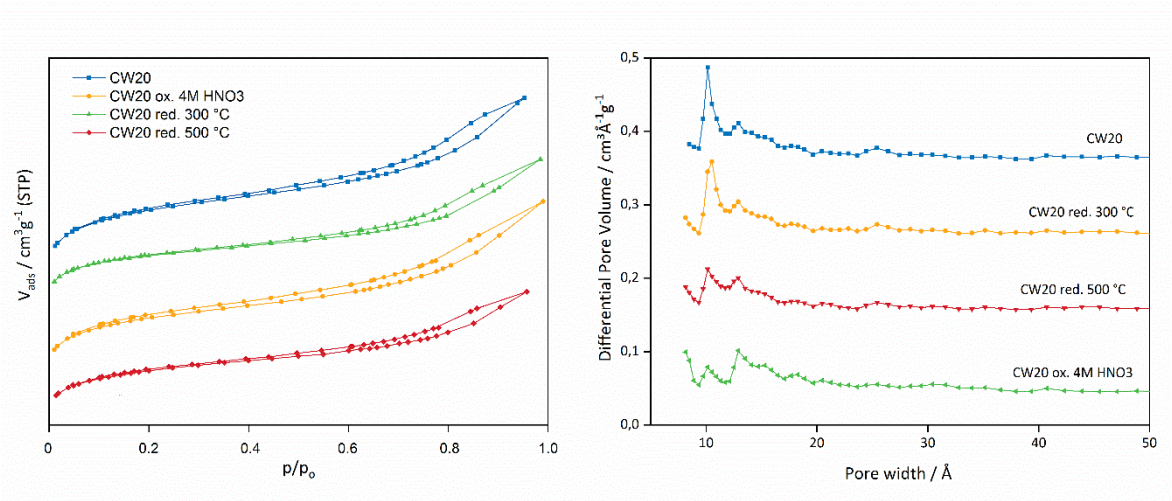

Figure S 5 Nitrogen physisorption adsorption-desorption isotherms (offset: 200 cm^3g^{-1}). (b) DFT pore size distributions (offset: 0.1 $cm^3A^{-1}g^{-1}$) of modified CW20 carbons.

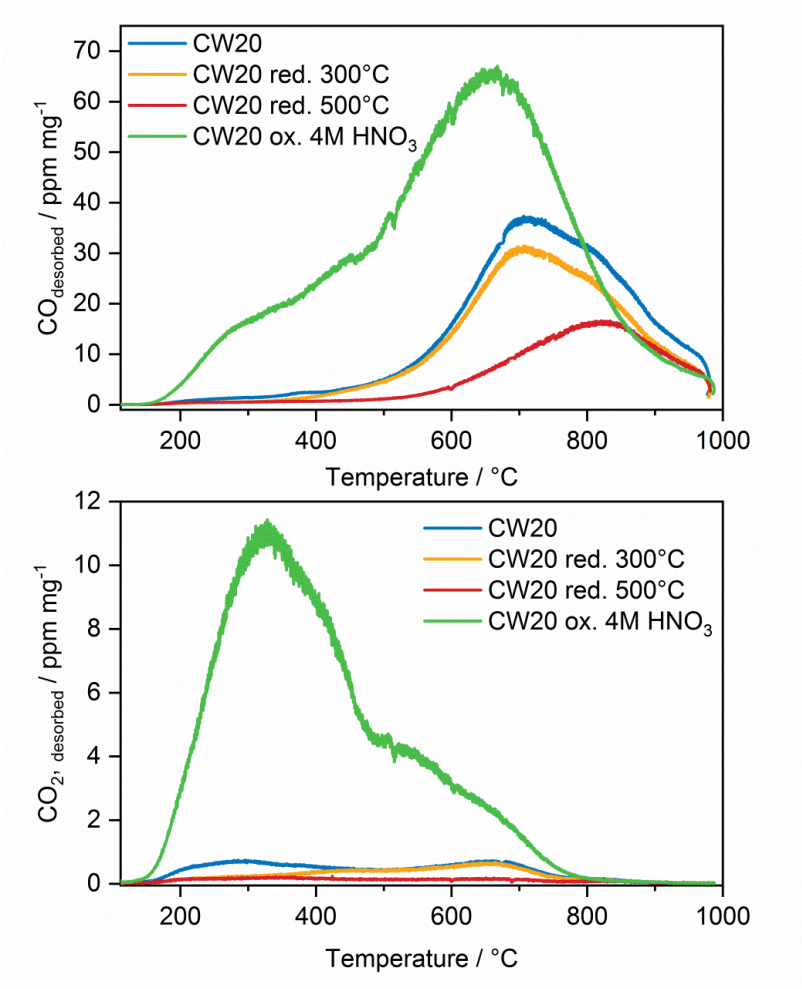

Figure S 6 Rates of CO and CO_2 released during TPD-MS analysis of the modified Silcarbon CW20.

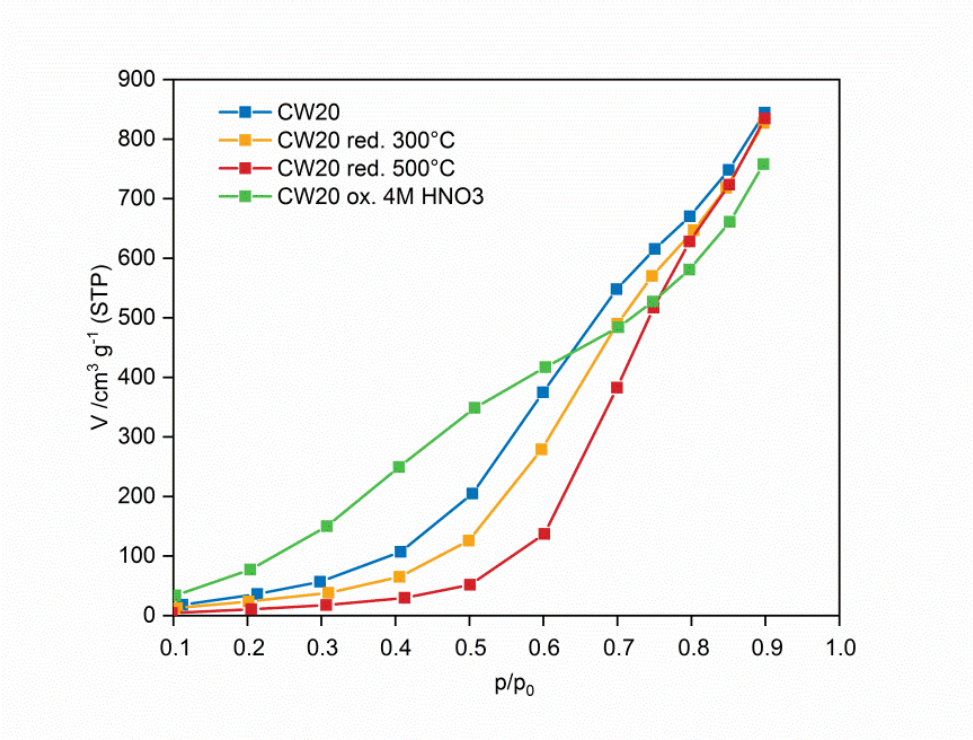

Figure S 7 Water vapor adsorption isotherms of modified Silcarbon CW20 at 30 °C.

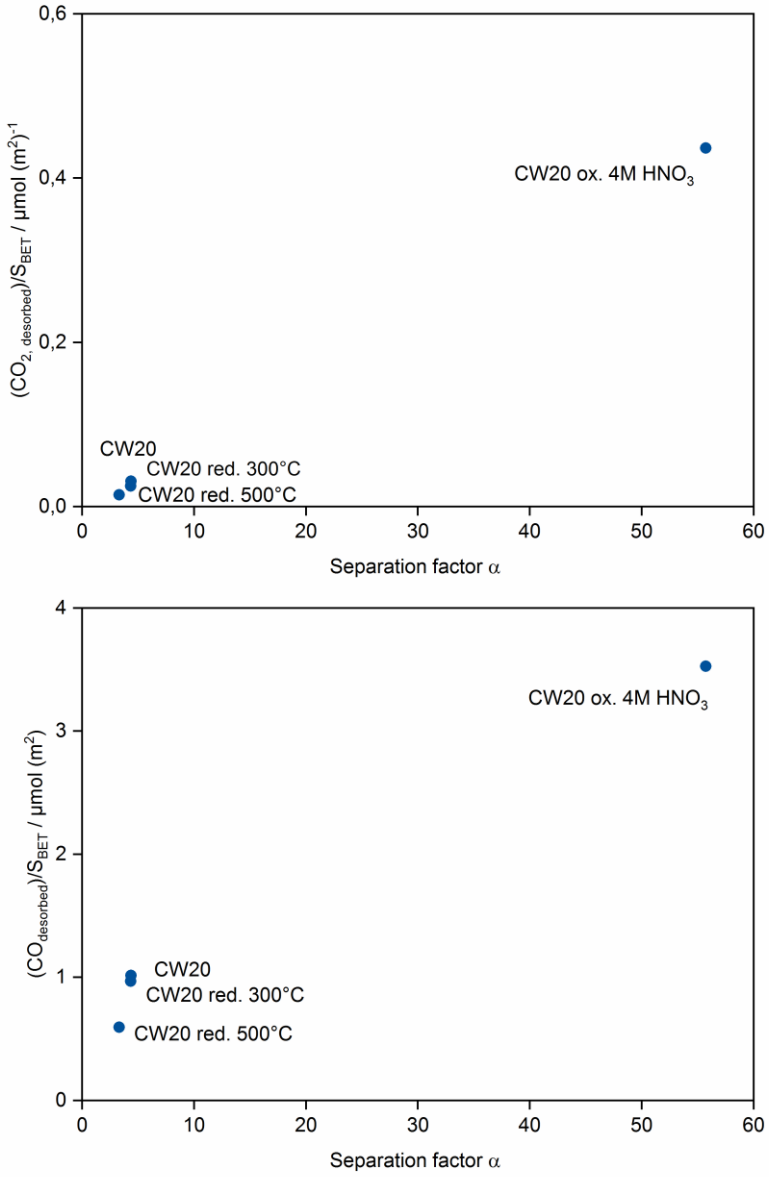

Figure S 8 Separation factor as a function of CO_2 and CO (normalized by specific surface area**)** released during TPD-MS analysis for modified Silcarbon CW20.

Recycling Study

The recycling studies were conducted in a fixed-bed column setup filled with the activated carbon CW20 (ox. 4M HNO_3) at 30 °C. The adsorptive aqueous solution of lysine was pumped through the fixed-bed by an HPLC pump and a feed flow rate on 1 mL min^{-1}. For desorption studies H_2O was used with a similar flow rate. The fixed-bed contained 0.2 g of adsorbent. Sample fractions were taken each minute and analyzed by HPLC analysis.