**Additional information:**

1. TEM analysis

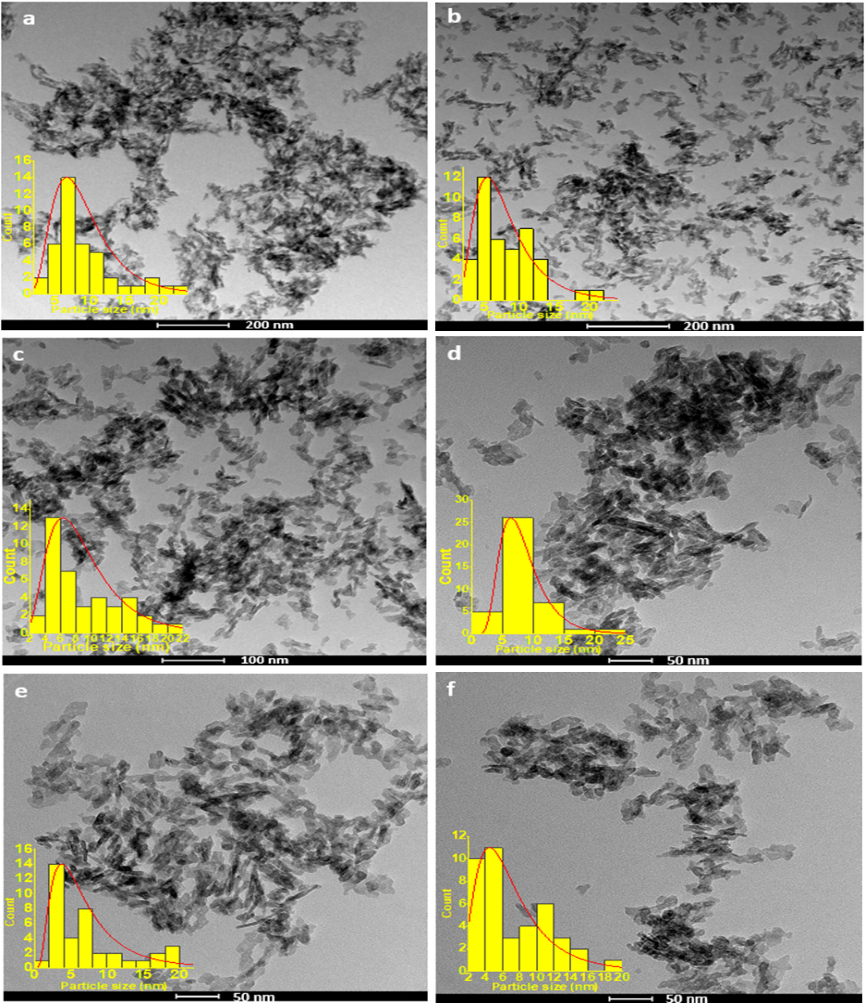
****

Figure S1: TEM images and the corresponded particle size distribution of (a) 10Cu10Na2O, (b)10Cu10CaO, (c) 20Cu10CaO, (d) 30Cu10CaO, (e) 20Cu5CaO and (f) 0.5Rh20Cu5CaO.

1. **N2 adsorption-desorption measurements**

Surface area and pore volume are significant factors affecting the adsorbent uptake capacity. Generally, this is because higher pore volume allows to trap more CO2 within the pores. In addition, the surface area also influences the portion of effective interaction between the adsorbents and CO2. The BET isotherm for nitrogen adsorption-desorption obtained with the synthesized materials are presented in Figure S2. The N2 physisorption isotherm of all materials was attributed to type (IVa), which is corresponding to the International Union of Pure and Applied chemistry (IUPAC) classification, indicating a mesoporous structure.

A collage of graphs

Description automatically generated

Figure S2: Isothermal linear plot of (a)10Cu10CaO, (b)20Cu10CaO, (c)30Cu10CaO, (d) 20Cu5CaO, and (e) 0.5Rh20Cu5CaO.