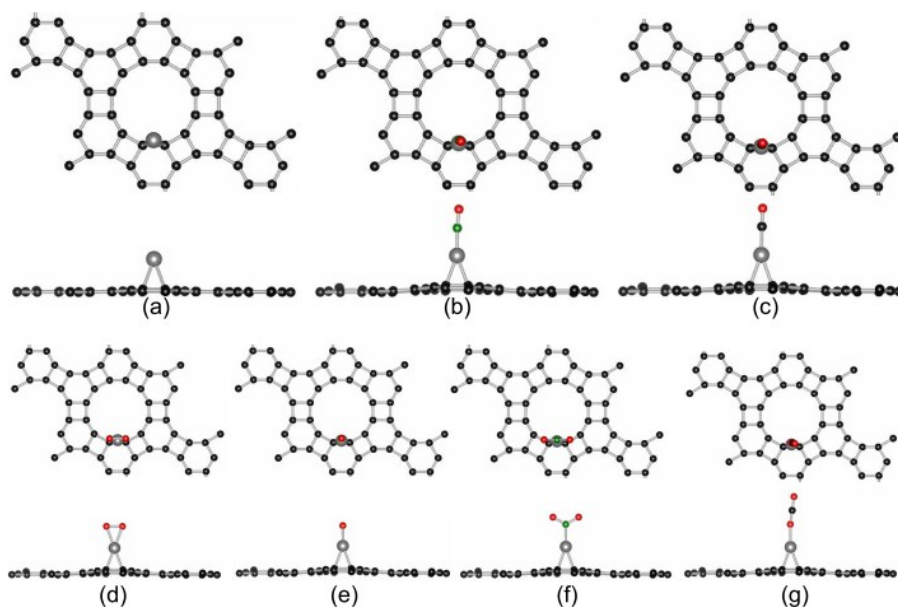


### Supporting information



**Fig. S1** The stable geometries for (a) Cu-graphenylene and (b) NO, (c) CO, (d) O<sub>2</sub>, (e) O, (f) NO<sub>2</sub>, (g) CO<sub>2</sub> adsorbed at Cu-graphenylene sheet, respectively. Black, gray, green and red balls represent the C, Cu, N and O atom, respectively.