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Through Microwave (MW) irradiation, it is possible to synthesize and treat nanoparticles (NPs) because of its faster, cleaner and cost effectiveness than conventional and wet chemical methods. In this study, graphene/metal oxides nanocomposites were synthesized and post-treated by MW irradiation by commercial microwave oven. Synthesized samples were characterized using scanning electron microscopy (SEM), X-ray diffraction (XRD), and transmission electron microscopy (TEM). Sensing response of the MW irradiated graphene/metal oxides nanocomposites sensors to different gases was tested and the results were compared with pristine metal oxides and graphene/metal oxides composites without MW irradiation. The gas sensing results showed that the MW irradiated graphene/metal oxides nanocomposites sensor had higher response to gas and better selectivity and shorter response/recovery times than un-irradiated graphene/metal oxides and metal oxides sensors.