Supporting Information

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Section 1. Characterization of Mn_3O_4 and reduced graphene oxide nanocomposites by XPS

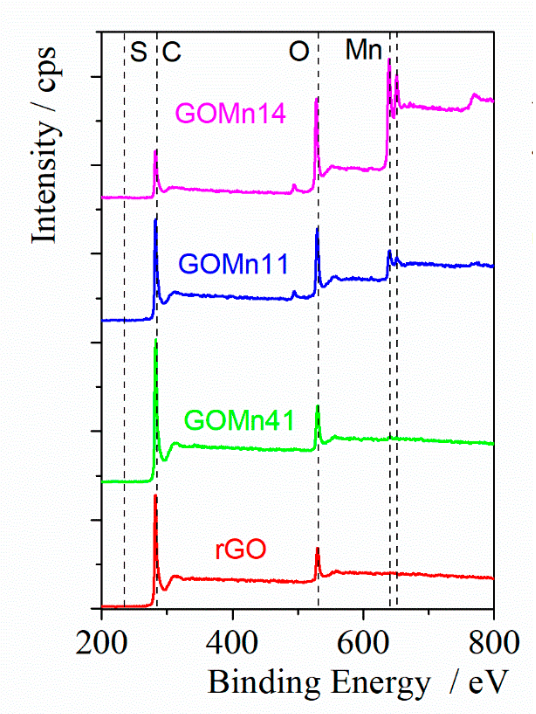

Figure S1. XPS survey spectra.

The presence of C, O and Mn atoms was revealed by the survey spectra plotted in Figure 1a. Thus, bands at 285 eV and 530 eV, assigned to C1s and O1s, appear in all materials, while the two peaks centered at 642 and 653 eV, consistent with binding energies of Mn $2p^{3/2}$ and Mn $2p^{1/2}$, respectively, appeared in hybrids, and its intensity increases with the percentage of Mn used in the synthesis. The presence of these two bands in the survey spectrum indicates the presence of Mn_3O_4, which perfectly matches the previously reported values for hausmannite [1,2]. Hausmannite contains both manganous and manganic ions [3,4]. Therefore, if the difference in the binding energies of manganous and manganic ions in hausmannite is large enough, the XPS spectrum will have a larger doublet separation of Mn 2p1/2 and Mn 2p3/2 spin-orbit levels than the simple oxides [1,2]. The XPS spectra of Mn 2p are analyzed in Figure S2 of the Supplementary Materials.

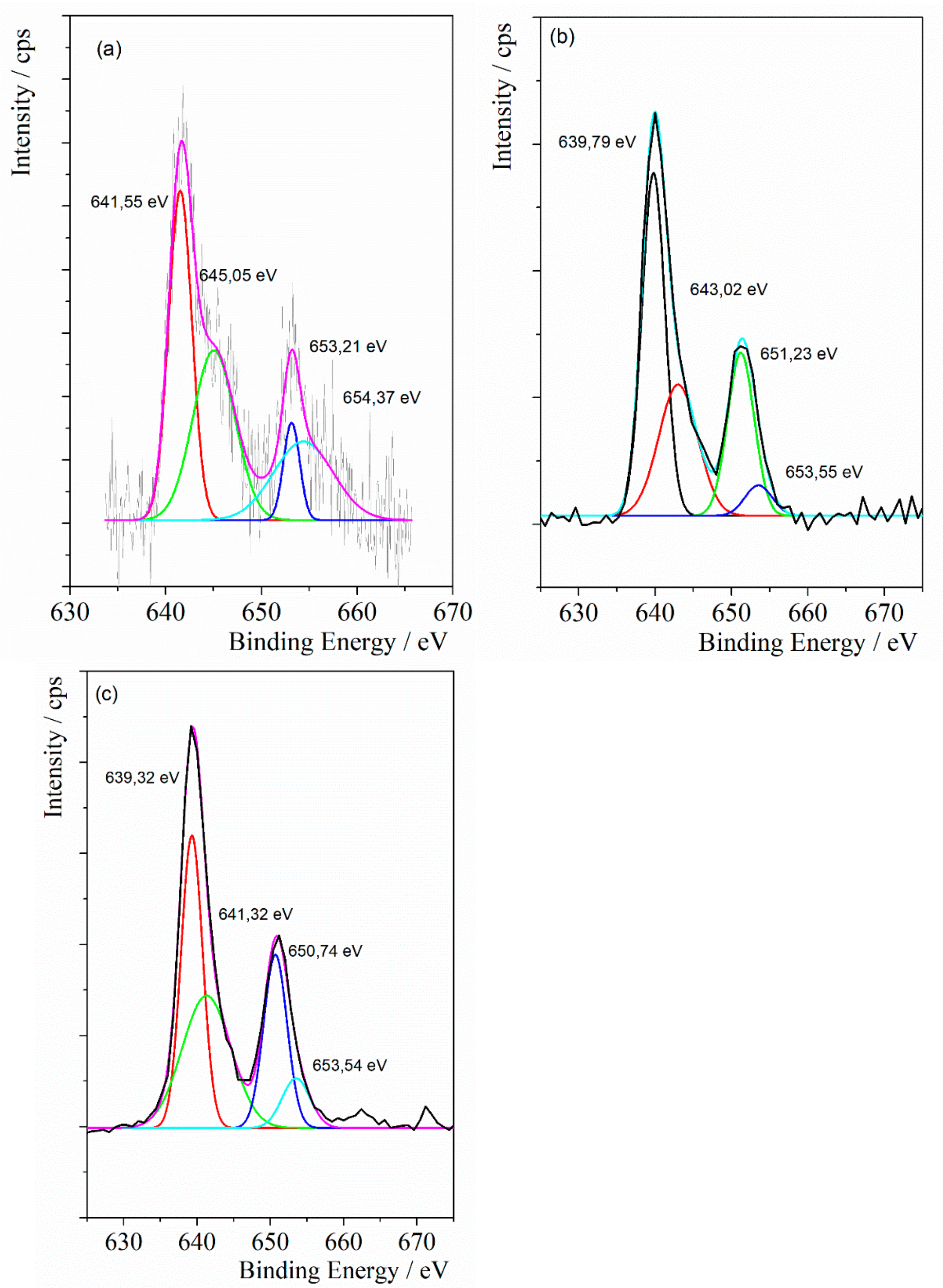

Figure S2. X-ray photoelectron spectra of Mn 2p core level of hybrids based on Mn_3O_4 and reduced graphene oxide. (a) GOMn41, (b) GOMn11, (c) GOMn14.

REFERENCES

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