Supporting Information

The Role of Oxidation Pattern and Water Content in the Spatial Arrangement and Dynamics of Oxidized Graphene-based Aqueous Dispersions

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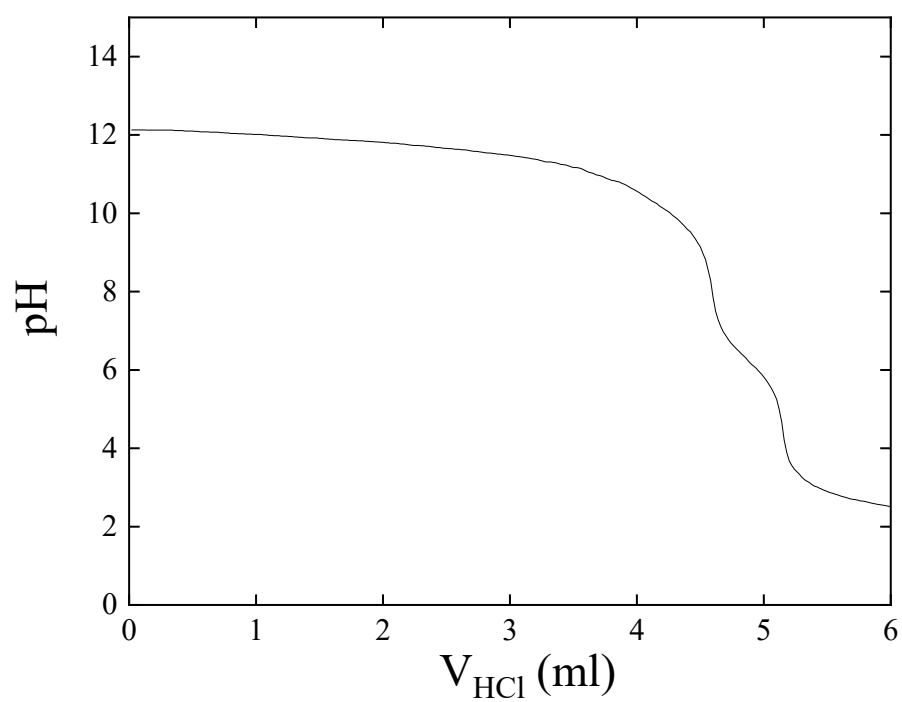4. Department of Chemistry, University of Crete, 70013 Heraklion Crete, Greece

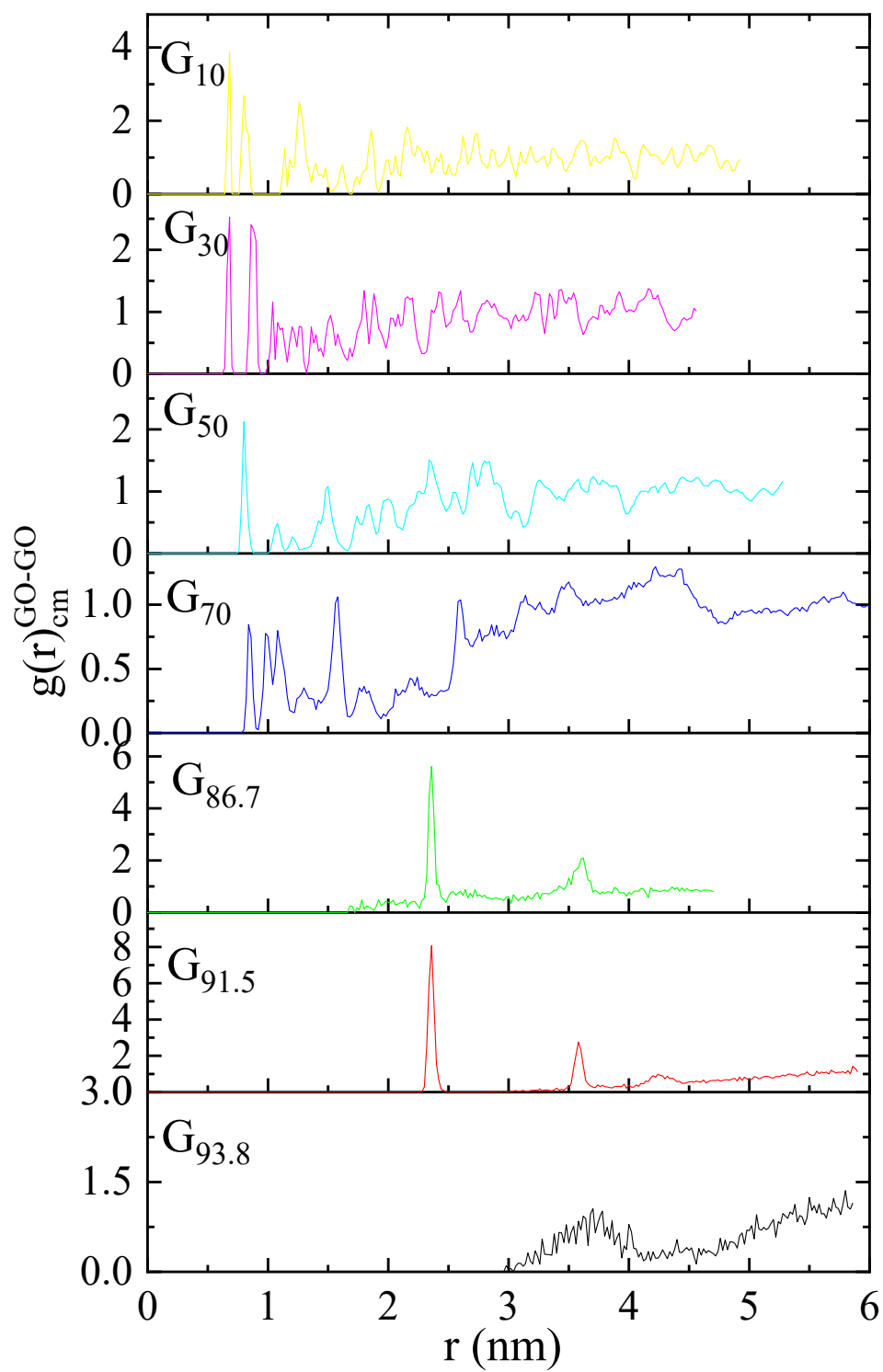**Figure S1**: Titration curve of GO oxidized with 0.5 g of $KMnO_4$.

Figure S2: Radial distribution functions of the geometric centers of the GO-based systems.
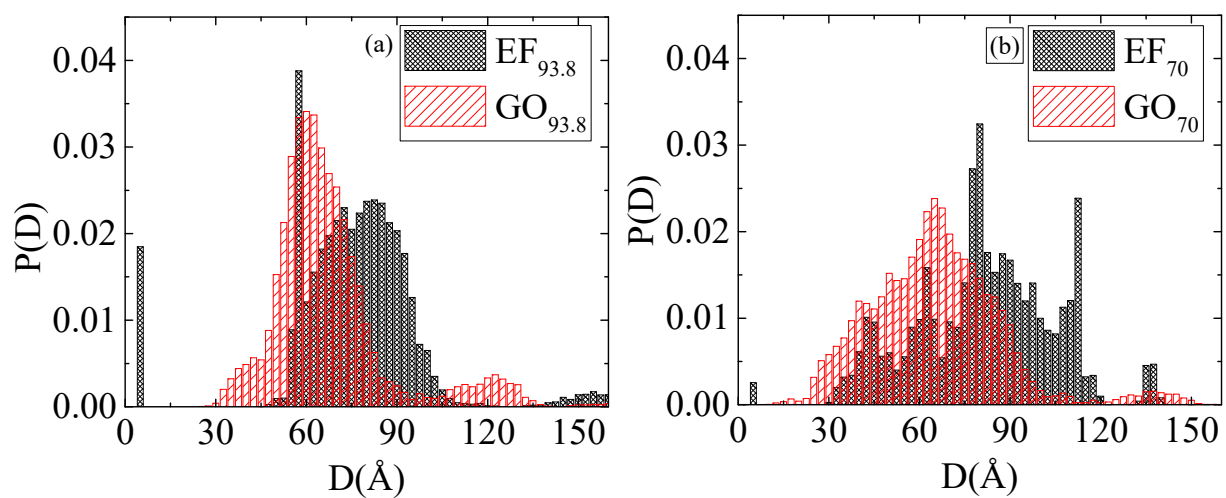
Figure S3. The probability distribution of the inter-sheet separation between all pairs of graphene sheets for the GO and the EF-based systems a) $EF_{93.8}$,$GO_{93.8}$ b) EF_{70},GO_{70}
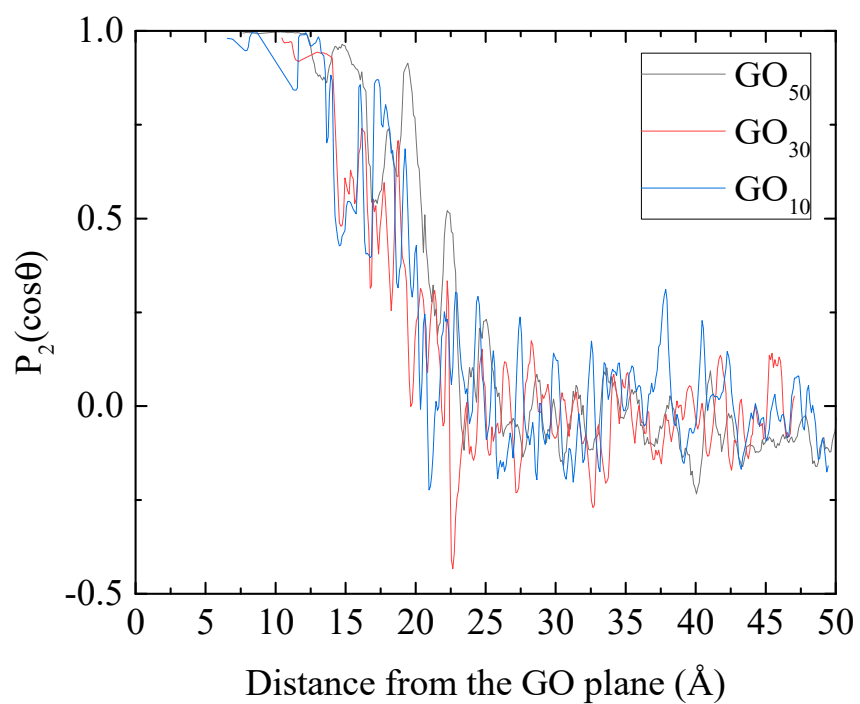
Figure S4: The orientational order parameter of the GO flakes as a function of their separation, for systems comprised by 56 flakes and at 50, 30 and 10 wt% water content.
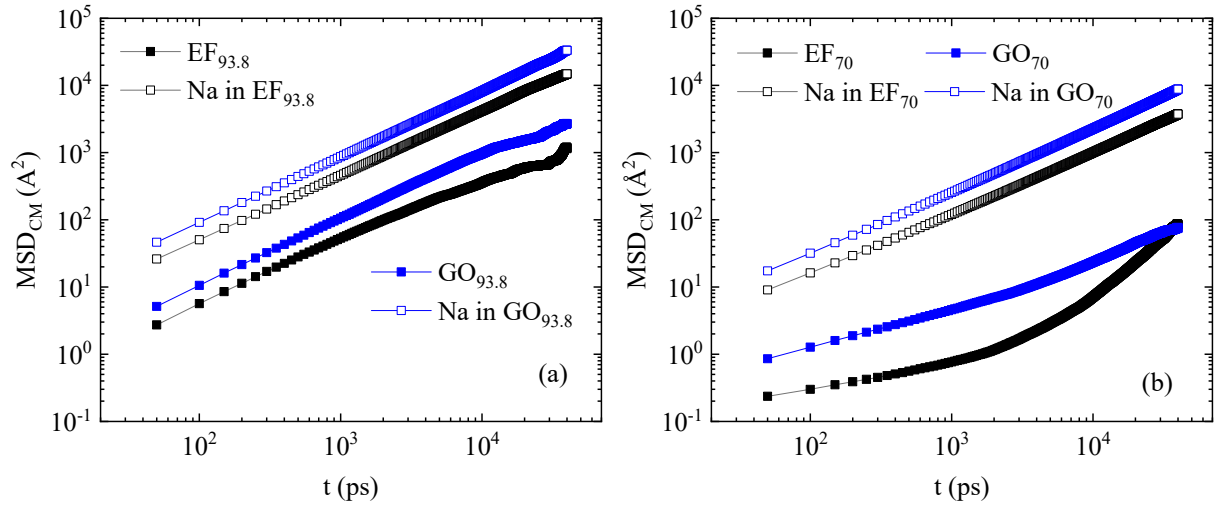
Figure S5: Comparison of the mean squared displacement of the sodium counterions and the center of mass of the EF and the GO flakes, at water contents : a) 93.8 % b) 70%
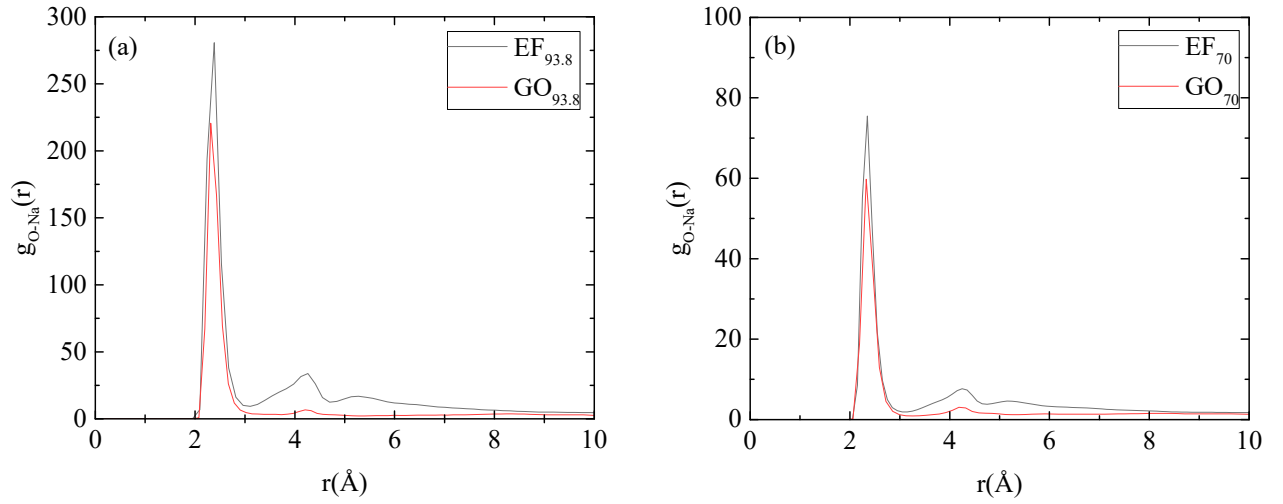

Figure S6: pair correlation functions between the sodium ions and the carboxyl oxygen of the flakes for the EF and the GO-based systems at water contents wt% a) 93.8% and b) 70%
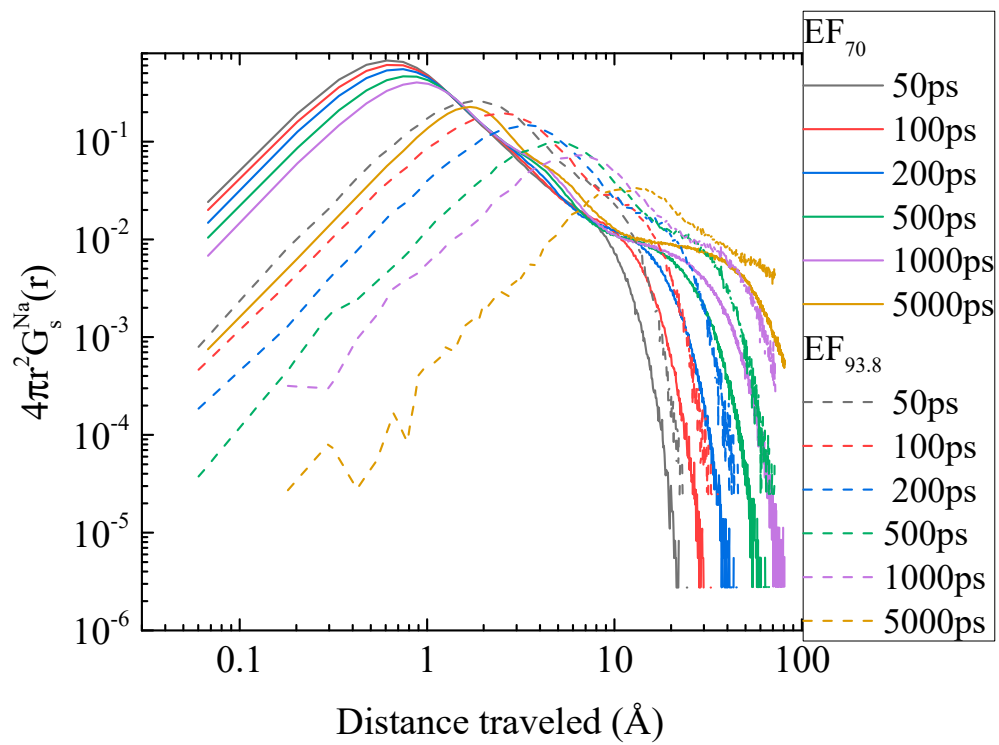
Figure S7: Comparison of the Self van Hove spectra of the Na+ counterions in the EF-based systems at different timescales.
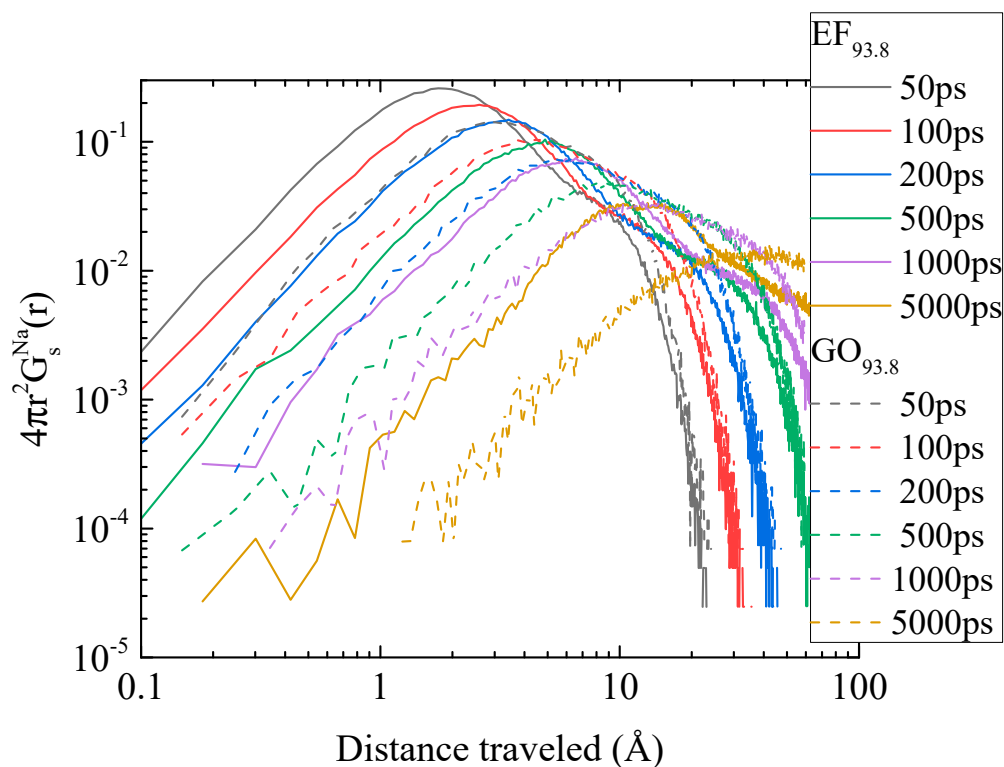
Figure S8: Comparison of the self van Hove functions of the Na+ counterions between the EF and the GO based systems at 93.8% wt% in water content
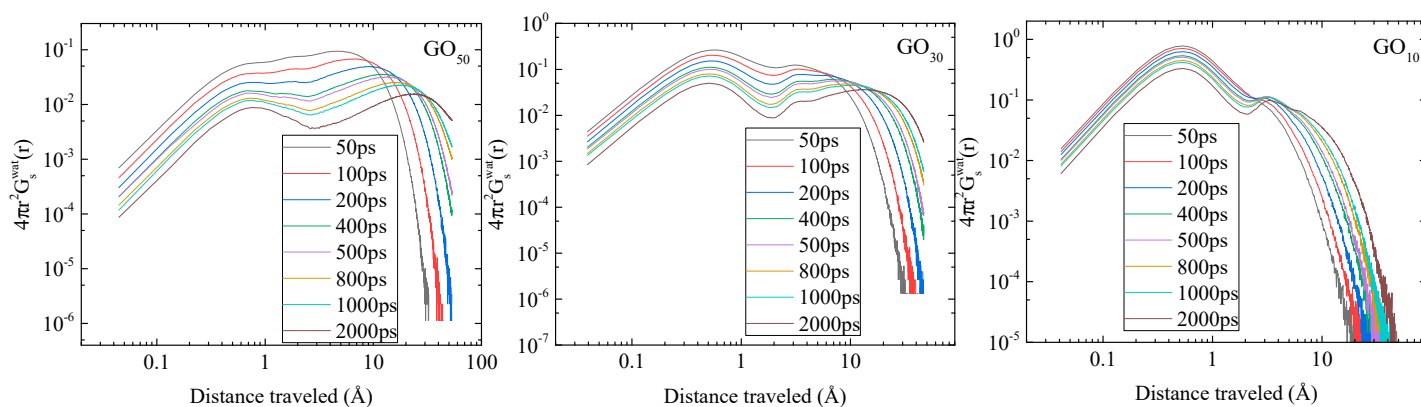

Figure S9: Self van Hove functions of the centers of mass of the water molecules for the lower water content systems of the GO-based models.
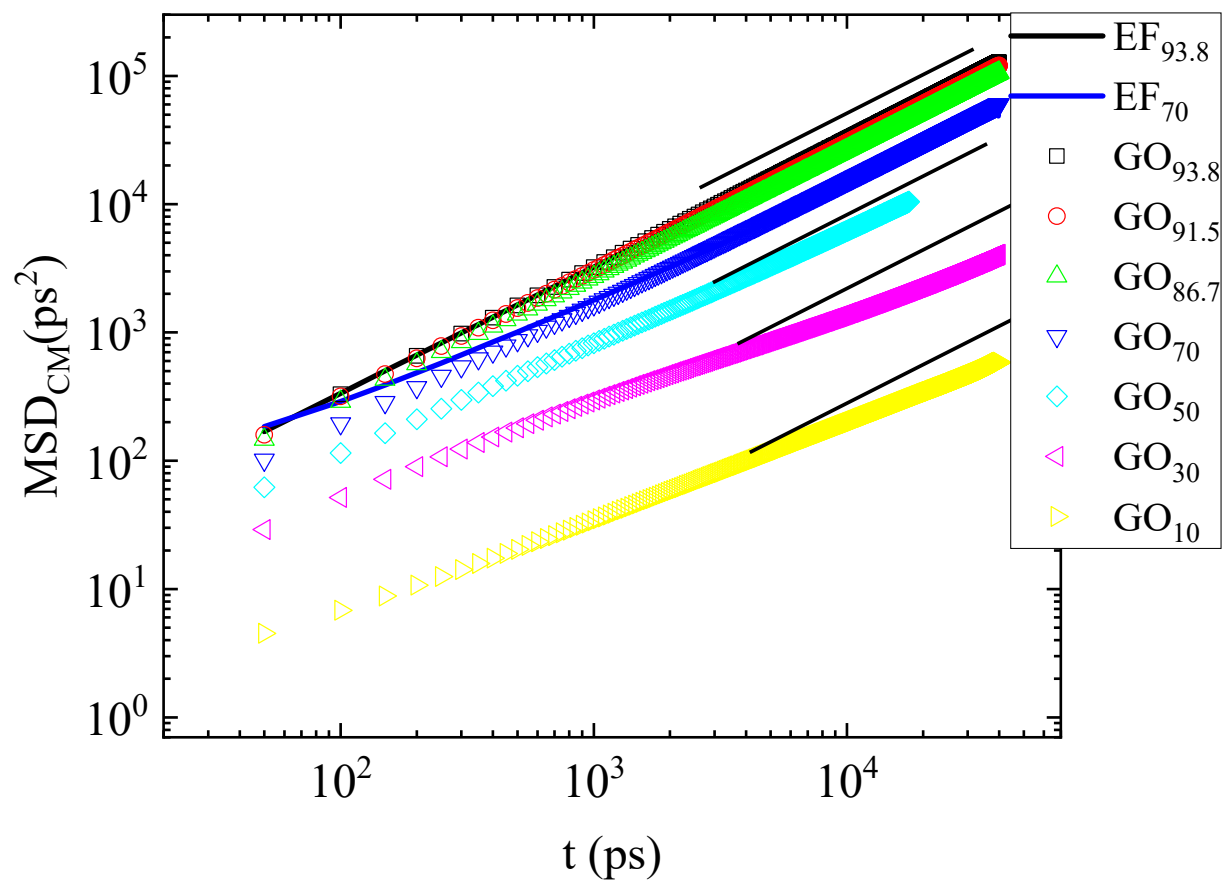
Figure S10: Mean squared displacement of the centers of mass of the water molecules for all the models examined. The short straight lines denote a slope of 1.