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Biomolecular interactions of emerging two-dimensional materials with aromatic amino acids . SAI SUNIL KUMAR MALLINENI[1], MEHMET KARAKAYA[2], RAMAKRISHNA PODILA[3], APPARAO RAO[4], None — The present work experimentally investigates the interaction of aromatic amino acids, viz., tyrosine, tryptophan, and phenylalanine with novel two-dimensional (2D) materials including graphene (G), graphene oxide (GO), and boron nitride (BN). Photoluminescence, micro-Raman spectroscopy and cyclic voltammetry were employed to investigate the nature of interactions and possible charge transfer between 2D materials and amino acids. Consistent with previous theoretical studies [1,2], graphene and BN were observed to interact with amino acids through π-π interactions. Furthermore, we found that GO exhibits strong interactions with tryptophan and tyrosine as compared to graphene and BN, which we attribute to the formation of H-bonds between tryptophan and GO as shown theoretically in Ref. 2. On the other hand, phenylalanine did not exhibit much difference in interactions with G, GO, and BN.(1) The Journal of Chemical Physics 130, 124911 (2009) (2) J. Phys. Chem. Lett. 2013, 4, 3710−3718

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