Gold in its bulk phase is chemically inert, but when its size is lowered to the scale of nanometers, gold starts to show chemical activity, and can be used in catalysis. However, when weakly bond to a substrate, small gold clusters can migrate and coalesce, increasing their diameter and decreasing their catalytic properties. On the other hand, strong bonds to the substrate can change the electronic structure of deposited gold clusters and their catalytic activity. In this work, we performed density functional theory calculations to study the interaction of a 34 atoms gold cluster with different two-dimensional materials: pristine graphene, defective graphene (vacancy), boron nitride, tungsten diselenide and tiophenol functionalized graphene. In order to evaluate the interaction and the resulting electronic structure of the interacting system (gold cluster and the 2-D substrates) we determined the binding energies, the density of states, the band decomposed charge densities, and the charge densities rearrangements due to the chemical bonds. All calculations were performed utilizing the code VASP, with the exchange and correlation functional treated with the generalized gradient algorithm (GGA-PBE). Our results indicate that the gold cluster strongly interact with the tiophenol functionalized graphene and the tungsten diselenide, with binding energies of -1.17 eV and -0.91 eV, respectively. The interaction between gold and defective graphene is significantly increased in comparison with pristine graphene (-0.33 eV and 0 eV, respectively). The boron nitride substrate is seen to repel the gold cluster, with the separate systems being more stable by 0.1 eV. The charge densities rearrangements showed for the strongly bonded systems (gold+tiophenol functionalized graphene and gold+tungsten diselenide) there is a significant charge exchange, indicating a covalent behavior. The density of states and the band decomposed charge densities suggest that the gold clusters retain their chemical activity in the strongly bond system gold+tungsten diselenide, presenting an amphoteric behavior, with the gold participating both in the HOMO and LUMO orbitals.