Chirality is a fundamental property of many molecules, including biomolecules like most amino acids. This property has also been found at the nanoscale, as it is evident from recent theoretical and experimental studies. In particular, bare and ligand-protected metal clusters, with size under 2 nm, display chiral behavior. In this talk, a brief review of the most recent results on this topic will be presented, focusing on a possible geometrical quantification of chirality through a calculation of the Hausdorff chirality measure for several well-known bare and ligand-protected gold clusters [1].

Results, based on density functional theory calculations, on the enantiospecific adsorption of the cysteine amino acid on a chiral Au$_{34}$ will also be discussed. These results confirm that the adsorption energy of the amino acid depends on which enantiomer of cysteine is interacting with the chiral gold cluster [2, 3]. It was also calculated the vibrational spectrum of the cysteine-Au$_{34}$ complex to investigate the existence of a vibro-enantiospecific effect, that will be related with different vibrational frequencies of the cysteine normal modes, depending on which enantiomer is adsorbed on the Au$_{34}$ cluster surface [4]. In order to verify this theoretical prediction it would be necessary the design and implementation of novel and accurate enantio-separation methods to perform vibrational spectroscopy measurements. Recent experimental progress along this direction will be mentioned.

**Keywords:** Chirality, Clusters, Enantiospecific Adsorption

**References:**


**Presenting author’s email:** garzon@fisica.unam.mx