**Introduction:**

Supra molecular is made by Non-covalent interaction among small species.1-3 In supramolecular chemistry calix[n]arenes as phenol-based macrocycles are recognized, which due to their extraordinary physical and chemical features toward other macrocycles have a superior advantage.4-6 Supramolecular chemistry was divided into two major categories: host-guest chemistry and auto-assembly 7,8. Due to the host-guest relationship, shallow bowl shape Calix[n]arenes with hydrophobic cavities have the most outstanding feature as applicable building blocks to accommodate smaller non-polar molecules or ions and play the role of hosts in macrocyclic chemistry9-13. Covalent assembly of two subunits of calix[n]arene is a helpful method of adapting supramolecular receptors with a bigger cavity 14,15. Calix[n]arenes have been considered and utilized for several applications including organocatalyst16, separation [S1]12, and more for biomedical fields [ b1] 13. An extremely important characterization of calix[n]arenes as macro cyclic and building blocks is that they via their upper and lower edges with wide range of functional groups can be modified and functionalized in order to construct a strong and effective platform for biological applications [ مرجع ]. Calix[4]arene has variable conformations[ref r], the Simplest calix[4]arene is with the cone geometry and an open cavity. The cavity created via upper and lower rim and by functionalizing can be tuned and engineered, which following that surface chemistry would be fundamentally promoted. 3-9 Functionalized Calix[4]arenes have a high biological activity and as host molecules have been receiving further consideration by researchers [ مرجع 2017]. Dimer calixarene is an applicable model to recognition bigger guest’s molecules. Three kinds of methods have been used to link two calixarene units together to make a dimer; (a) upper rim-upper rim or head to head, (b) lower rim-lower rim or tail to tail (c) upper rim-lower rim or head to tail. When two calixarene molecules are linked together, a hollow and hydrophobic cavity is formed. The interior dimension is large enough to encapsulate small to medium sized guest molecules. 10-15 In many research study potential application of Calix[n]arene and Calix[n]arene based material for the targeted drug delivery have been demonstrated and highlighted [مراجع x] . In a research work for bio-sensing applications a Calix[n]arene based composite was constructed and employed [مرجع] . Based on the finding the functionalized pegylated Calix[n]arene demonstrated an excellent bio conjugation in response to a cancer biomarker . Lue zhou et al. in a review study highlighted the recent advances of employing Calix[n]arene for a controlled drug delivery system. The pegylated guanidinium-modified Calix[5]arene as employed as Nano carrier demonstrated a higher performance in loading and encapsulating the anti-cancer drug compared to the liposomes [ ]. It was reported that Calix[n]arene and Calix[n]arene based material possessing high bio compatibility and non-cytotoxicity ….. have a more significant functionality for drug delivery system. Calix[n]arene as assessed for magnetic resonance imaging (MRI) displayed a remarkable relaxivites within a considerably broad Larmor frequencies. In this review it has been attempted that after an introduction of calixarenes as the promising materials their potential application for biological treatment be further highlighted. For this subject, we have described the synthesis methods of Calxi[4]arenes and following that their high capability in recognizing DNA, drug delivery, biosensor has been pointed out and discussed.

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