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Interlocking molecules and polyhedral links

Knots and links are ubiquitous in chemical systems. Their structure can be responsible for a variety of physical and chemical properties, making them very important in materials development. We analyze the topological structures of interlocking molecules composed of metal-peptide rings using the concept of polyhedral links. To that end, we discuss the topological classification of alternating polyhedral links. We show that the alternating link diagrams of polyhedral links of certain types do not admit nontrivial flypes. Hence, by the affirmative answer of the Tait flyping conjecture, the classification of the topology of these interlocking structures can be achieved by simply analyzing their alternating diagrams.