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Structure and Properties of Pseudo-Graphenes. Review

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Abstract. In this review, we consider structure and properties of pseudo-graphenes – graphene-likecrystals with high density of non-hexagonal (defective or improper) carbon atomic rings. As an introduction, graphene and its properties are briefly described anddisclination defects in graphene are considered. Then, numerous articles presenting*graphene allotropes* and *carbon allotropes* are analyzed. As a result, a term *pseudo-graphene* for description of materials with high density of improper carbon atomic rings arranged periodically is proposed and a unified classification of pseudo-graphenes regarding the materials from observed articles is suggested. The material chart is created based on proposed classification and material properties. In this chart, two categories are reviewed separately: sp^2 pseudo-graphenes and non-sp^2 pseudo-graphenes. The analyzed materials are subdivided into semiconductors, metals, semimetals, and superconductors.

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