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State of the art and future perspectives of traditional carbon materials and new carbon forms

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Carbon materials cover a wide range of structures and may exhibit very different properties. Traditional carbon materials such as carbon fibers, activated carbons or carbon-based composites, mainly prepared from petroleum or coal derivatives, served from decades as a vanguard in several industrial applications and are still nowadays the worldwide leaders in carbon material´s production. The discovery of new carbon forms such as graphene produced a revolution in the field at a scientific level which is being nowadays consolidated in specific applications. A detailed discussion of the evolution at an industrial and scientific level of traditional carbon materials and the new carbon forms will be the focus of the presentation. In this regard, some relevant results obtained by our group (Composites Group) in both traditional carbon materials (carbon fibers, activated carbons and activated carbon fibers, composites) and graphene materials are also presented. These include some recent advances and new perspectives on the technologies used for the preparation of graphene based materials according to their subsequent application. Information about their use in different applications such as structural and environmental ones (air/water purification, desalination, water splitting, etc.), catalysis, health or energy storage, will be also discussed.