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Editorial

This Virtual Special Issue (VSI) of *Applied Surface Science* presents a selection of scientific articles that were presented at the 25th Congress of International Federation for Heat Treatment and Surface Engineering, which were expanded into full-length, peer-reviewed articles. The congress was held in Xi'an, China, on September 11–14, 2018, and was organized by the Chinese Heat Treatment Society (CHTS) in collaboration with the International Federation for Heat Treatment and Surface Engineering (IFHTSE).

The 25th IFHTSE Congress set up a high-level platform for gathering researchers to exchange ideas, share new knowledge and future trends on fundamental and applied research of heat treatment and surface engineering technologies. More than 1200 registered participants from 40 countries attended this significant event. The congress included plenary sessions, keynote lectures and several specialized parallel sessions on different topics and applications.

This Virtual Special Issue selected 50 fully refereed papers from more than 700 crafted reports on this vitally important field to the congress, and concentrated on the atomic and molecular level or direct applications of functional surfaces and coatings properties determined with specific surface approaches, either by experimental techniques or computational methods. It covered topics contributing to a better understanding of surfaces and interfaces engineering, nanostructures and their applications, such as (1) Surface functionalization and surface nanocrystallization, (2) Deposition, modeling and growth mechanisms associated with coatings, (3) Enhanced properties/performance of coatings, (4) Electrochemistry at surface protection strategies, (5) Smart coatings, (6) Defect formation and structural evolution in surface layers subjected to high energy particle radiation, and (7) Advances in surface in-situ characterization. These accepted papers have novelty and gain new understanding and insights based on synthesis-characterization-properties-performance relationships of functional surfaces and coatings.

On behalf of the conference organization of the Chinese Heat Treatment Society, we would like to thank our invited plenary and keynote speakers, all the authors, session chairs, referees, and editors for their dedication to their profession. Once again, thanks to the International Federation for Heat Treatment and Surface Engineering (IFHTSE) for their help in co-organizing the conference, and also to the publisher of Elsevier for their help and cooperation in getting the special issue out soon after close of the meeting. Finally, we expect that this VSI will serve as a valuable source of information and guidance for materials scientists, engineers, and postgraduate students to reference as they devote themselves to developing advanced surfaces science and coatings technologies to address current and future industrial needs.

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