Editorial

Energy, Water and Air Catalysis Research (EWA Cat. Res.) – A New Journal on Recent Trends in Catalysis

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The importance of catalysis is unquestionable! Indeed, almost 90% of all commercially produced chemical products involve the use of catalysts at some step of their manufacture [1]. Considering the key words of "catalysis" or "catalyst" more than one million papers could be found in The Web of Science (1,107,622 on May 14, 2024), including about three hundred "hot papers" and more than twelve thousand "highly cited papers" (12,502). It should be pointed out that the research on environment and energy are probably the most popular, as suggested by the growing number of scientific reports, i.e., more than sixty thousand works (including 64 hot papers and 1866 highly cited papers) and one hundred thousand manuscripts (including 113 hot papers and 3685 highly cited papers), respectively (Figures 1 and 2). Among all papers on catalysis, the study by Hoffmann et al. on the environmental application of semiconductor photocatalysis has been cited the most, reaching 16,872 citations (May 14, 2024) [2]. Recently, more and more studies have focused on "green"-based processes, i.e., leading to energy conversion and purification of water/air via environmentally friendly technologies. Here, among various methods, the use of solar energy (both natural and simulated) to drive various catalytic reactions is probably the most popular, as evident by highly cited research and review papers in these topics, such as solar water splitting [3–5], artificial photosynthesis [6], photocatalytic reduction of carbon dioxide [7], environmental remediation [6], water treatment [8], degradation of dyes [9,10], removal of dangerous compounds (e.g., antibiotics and Cr(VI) [11]), fuel generation [12], and various environmental applications [13]. Additionally, other "green"-based processes have also been extensively studied, including works on energy storage [14], electrocatalysts for energy conversion reactions [15], biodiesel production [16], conversion of biomass and waste plastics [17], electroreduction of carbon dioxide [18], hydrogen evolution [19], water electrolysis [20], oxygen reduction catalysts for fuel cells [21], seawater splitting [22,23], carbon dioxide hydrogenation [24].

All these reports have been published in various journals, focusing on catalysis and other fields of science (chemistry, materials science, physics, surface science, environment, water, (micro)biology, etc.). Although a large number of journals on catalysis and relevant topics are easily available, the new journal on *Energy, Water and Air Catalysis Research* (*EWA Cat. Res.*) has been launched to address recent trends in catalysis, covering especially energy-oriented and environmental research (Figure 3). The journal establishes a platform for multidisciplinary discussion and urgent papers to promote the understanding of catalytic reactions, physical chemistry of catalysis and possible commercialization of catalytic processes in the field of environment and energy.

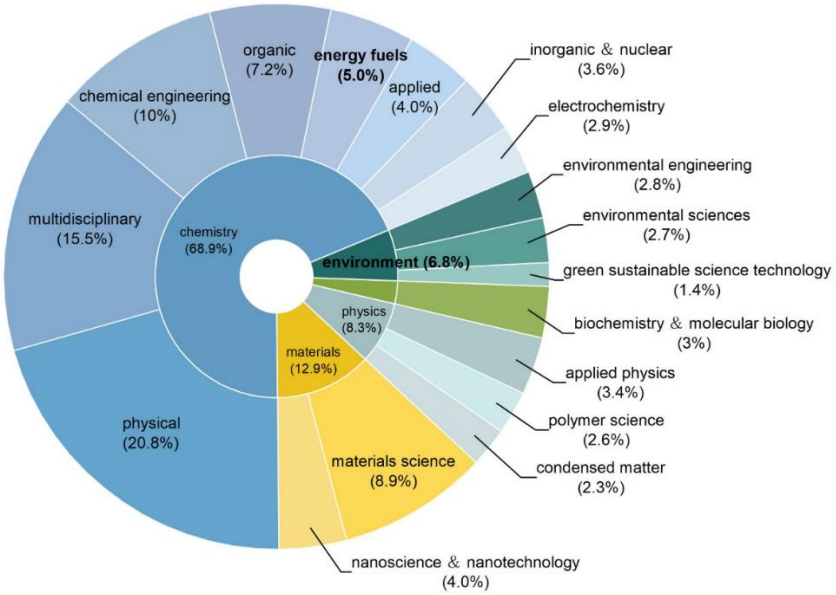

Figure 1. Distribution of papers on catalysis/catalysts, refined by The Web of Science Categories (searched in The Web of Science using: "catalysis" or "catalyst", 17 May 2024).

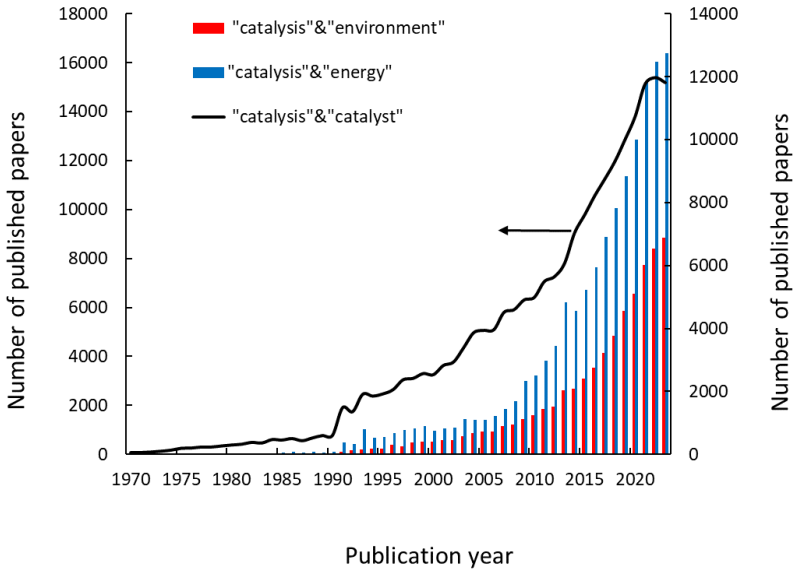

Figure 2. Number of papers published annually on catalysis (searched in The Web of Science using: (i) "catalysis" or "catalyst", (ii) "catalysis" and "environment", and (iii) "catalysis" and "energy", 14 May 2024).

Figure 3. The graphical abstract of targeted content for *Energy, Water and Air Catalysis Research* journal.

EWA Cat. Res. will publish communications, research articles, perspectives (only by invitation) and comprehensive reviews across the fields of catalysis, including all aspects of catalysis, such as (1) synthesis and characterization of catalysts, (2) nanoarchitecture design of catalysts, (3) morphology controlled materials (0D, 1D, 2D and 3D structures), (4) understanding of catalytic reactions (mechanism investigations), (5) solar energy conversion, (6) electrocatalysis, (7) photocatalysis, (8) biocatalysis, (9) thermocatalysis, (10) catalytic reactors (design, modelling and computer simulations), (11) water splitting, (12) hydrogen generation, (13) catalytic devices for purification of water and air, (14) antimicrobial performance, (15) toxicity aspects (concerning catalysts, reactants and products of catalytic reactions), (16) coupling of catalysis with other methods, (17) self-cleaning coatings and materials, (18) energy storage and transport, (19) artificial photosynthesis, (20) synthesis of chemical compounds, (21) solar fuel, (22) solar energy, (23) applications and commercialization, (24) field experiments, (25) life-cycle assessment of catalytic materials and devices, (26) CO_2 reduction, (27) N_2 fixation, (28) surfaces and interfaces, (29) medical applications, (30) activation and deactivation of catalysts (e.g., for sunscreens). It should be mentioned that this journal will capture all new development and emerging technologies involving catalysis. Of course, there are many journals on catalysis, but *EWA Cat. Res.* will stand out based on its quality, standard and focus on environmental and energy aspects. It must be pointed out that the manuscripts with questionable/wrong research practices will not be accepted. For example, the research for proving the visible-light activity with only dyes as testing molecule is unacceptable, due to well-known sensitization mechanism causing "apparent vis activity" [25,26]. Moreover, the proper descriptions and right clarification of experimental details (to avoid misconducts and misconceptions) will be guarded. For example, in the case of heterogeneous photocatalysis, the correct identification of experimental procedure is highly important, such as (i) "solar light" should state for the use of sunlight (not lamps with similar light emission to the solar one), (ii) "water splitting" study should present the splitting of water into both products, i.e., hydrogen and oxygen (not only half reactions), (iii) "artificial photosynthesis" should discuss both generation of solar fuel and carbon dioxide reduction, (iv) the experiment under "visible light" should be performed only under this portion of radiation, etc. The correct presentation and analysis of experimental results will also be checked, such as bandgap energy estimation and Nyquist plots' drawing.

This new journal has already gained strong editorial board, comprising experts on various aspects of catalysis (homogenous [27], heterogeneous [28–31], photocatalysis [32–36], supramolecular [37], electrocatalysis [38–41], plasmonic [42–46]; architecture design of catalysts [47–56]; applied research, such as environmental purification [2,57–62], recycling [63,64], antimicrobial properties [65–67], solar energy conversion [68–70], magnetic separable catalysts [71–73], piezoelectricity [74], and that focusing on health concerns [75,76]) from all over the world, including Europe (France, Germany, Poland, Switzerland), Asia (China, India, Japan, Singapore, Thailand), America (USA) and Africa (Egypt). The candidate for editorial board, especially Youth Editors, who would like to work with us on the journal improvements are highly welcome. The journal team believes that *EWA Cat. Res.* will serve as a knowledgebase for a large scientific community, including both experience scientists and early-stage researchers.

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