

Trend on Corrosion Mitigation Research Paper Publication

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1. Introduction

Electric power generating plants, airplanes, ships, chemical processing and manufacturing plants, concrete structures, and many others – all are designed, operated and maintained for minimizing the cost and risks to the public from corrosion.

Many corrosion mitigation technologies - coating, plating, surface treatment, corrosion-resistant materials, corrosion inhibitors, electric protection, etc. - have been steadily researched and published.

Searching items of ‘nuclear corrosion mitigation’ and ‘corrosion mitigation’ in the Web of Science site, were surveyed and the first item survey gave 38 documents during 1993~2016, while the second gave 441 documents during 1990~2016.

Those papers were analyzed and arranged in the form of publication years and citation, document types, research areas, source titles, countries and languages, organization and funding agencies.

2. Trend on Nuclear Corrosion Mitigation Research

2.1 Publication Years & Citation

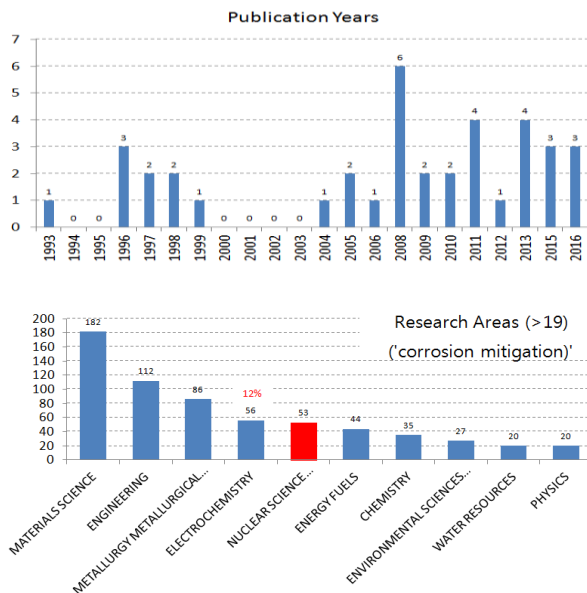


Fig. 1. The number of research papers according to publication years (upper) and the percentage of the publication number of the nuclear science and technology field (lower).

In the ‘corrosion mitigation’ search, the percentage of the publication number of the nuclear science and technology field was shown to be about 12%.

While, in the ‘nuclear corrosion mitigation’ search, the first publication year of the nuclear science and technology field appeared to be 1993.

2.2 Research Document Types

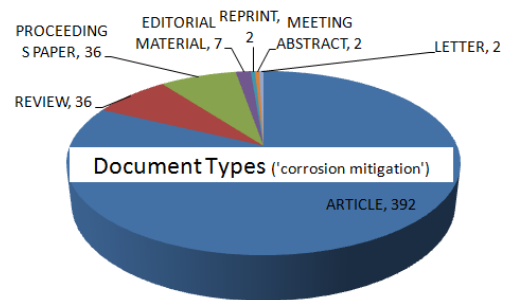


Fig. 2. The ‘corrosion mitigation’ research document types.

In the ‘corrosion mitigation’ field the number of article, proceeding paper, review paper, editorial material, letter, meeting abstract and reprint were 392, 36, 36, 7, 2, 2 and 2, respectively, while in the ‘nuclear corrosion mitigation’ field those were 35, 7, 3, 0, 0 and 0, respectively.

2.3 Research Areas

The ‘nuclear corrosion mitigation’ research areas were shown to be nuclear science technology, material science, engineering, metallurgy metallurgical engineering, including mining mineral processing, operations research management science, environmental science ecology, energy fuels and electrochemistry.

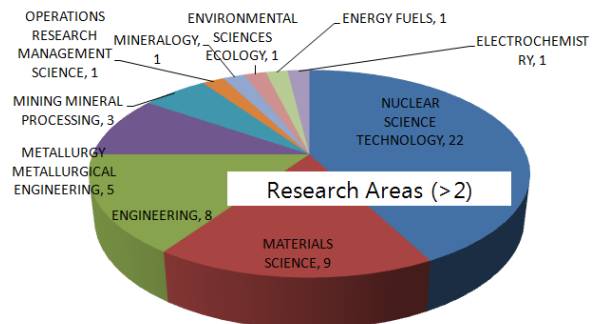


Fig. 3. The ‘nuclear corrosion mitigation’ research areas.

2.4 Research Source Titles

Among 38 source titles, the major ones were Nuclear Eng. & Design, Nuclear Sci. & Eng., Intl. J. of Pressure Vessels & Piping.

Table I: Source titles

Source Titles	Record
NUCLEAR ENGINEERING AND DESIGN	9
NUCLEAR SCIENCE AND ENGINEERING	4
INTL JOURNAL OF PRESSURE VESSELS AND PIPING	3
NUCLEAR ENGINEERING AND TECHNOLOGY	2
MATERIALS PERFORMANCE	2
JOURNAL OF NUCLEAR SCIENCE AND TECHNOLOGY	2
JOURNAL OF NUCLEAR MATERIALS	2
WELDING IN THE WORLD	1
RELIABILITY ENGINEERING SYSTEM SAFETY	1
PROGRESS IN NUCLEAR ENERGY	1
NUCLEAR PLANT JOURNAL	1
NUCLEAR ENERGY JOURNAL OF THE BRITISH NUCLEAR	1
MATERIALS CHARACTERIZATION	1
JOURNAL OF ENVIRONMENTAL RADIOACTIVITY	1
JOURNAL OF ENGINEERING MATERIALS AND TECHN	1
JOM	1
CORROSION REVIEWS	1
CORROSION	1
CHINESE JOURNAL OF MECHANICAL ENGINEERING	1
CHEMICAL ENGINEERING RESEARCH DESIGN	1
CHEMICAL AND PROCESS ENGINEERING INZYNIERIA	1
Total	38

2.5 Research Countries and Languages

The countries U.S., Taiwan, Republic of Korea, France, Japan, Germany, Canada, Switzerland, Slovakia, Russia, Poland, China, Netherland, Jordan, England, , Czech Republic, Belgium.

Republic of Korea is one of the active research countries in the world.

Languages are all English.

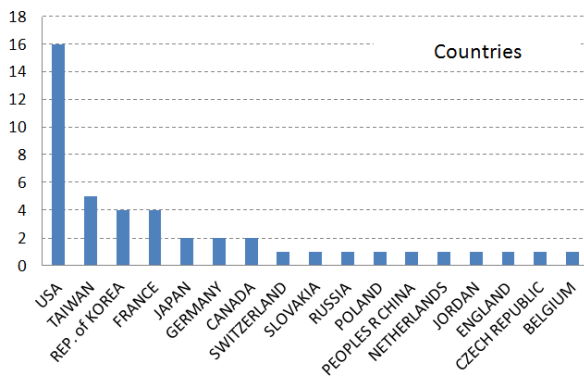


Fig. 4. The 'nuclear corrosion mitigation' research countries.

2.6. Research Organizations and Funding Agencies

The research organizations were US DOE, Taiwan Tsing Hua Univ., France CEA, Seoul Natl. Univ., Kyung Hee Univ., US EPRI.

Republic of Korea has given 4 papers.

Major funding agencies were Natl. Sci. Council and Taiwan Power Co., while the others were UNENE, US

NRC, US DOE, Canada NSERC, Korea NRF and MEST, etc.

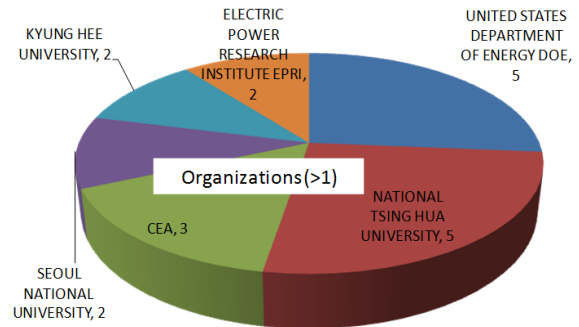


Fig. 5. The 'nuclear corrosion mitigation' research organizations.

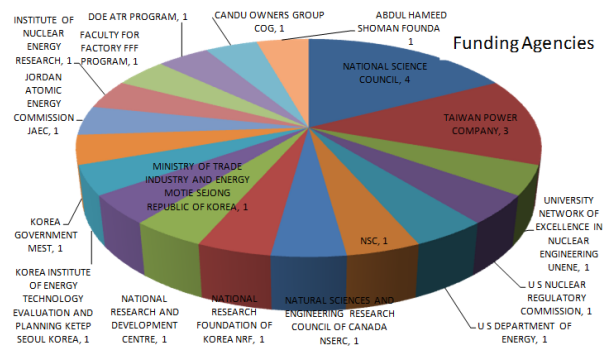


Fig. 6. The 'nuclear corrosion mitigation' research funding agencies.

3. Conclusions

In the 'corrosion mitigation' search, the percentage of the publication number of the nuclear science and technology field was about 12%.

The sum of the time cited and the average citation number per item in corrosion mitigation survey were 5059 and 11.47, respectively, while those in nuclear corrosion mitigation survey were 285 and 7.5, respectively.

Among 38 source titles, the major ones were Nuclear Eng. & Design, Nuclear Sci. & Eng., Intl. J. of Pressure Vessels & Piping.

The research organizations were US DOE, China Tsing Hua Univ., France CEA, Seoul Natl. Univ., Kyung Hee Univ., US EPRI, while Korea has given 4 papers which meant that Korea is one of the leading countries in the world in the research activities of the nuclear corrosion mitigation field.

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