

Abstracts**Production of Makeup Water with Ion Exchange Resins**

Jean Belles-Baumann

The use of ion exchange resins for purifying makeup water is the on-going state-of-the-art technology for this application. Water treatment with ion exchange resins is for the majority of sites the method of choice because of the high flexibility of this technology. In this paper, basic principles of ion exchange are explained, and the different ion exchange systems and technologies, including operating conditions, are reviewed and compared. Furthermore, the important role of proper pretreatment and operating temperature is discussed. Some principles of ion exchange plant design and plant monitoring are described in detail. Finally, technical hints are given for maintenance and protection of ion exchange resin plants during operation and shutdown periods.

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Meetings of the IAPWS Working Group "Power Cycle Chemistry" in Santorini, Greece, July 3–8, 2005

Geoff Bignold and Robert Svoboda

In July 2005, the 2005 Annual Meeting of the International Association for the Properties of Water and Steam (IAPWS) took place in Santorini, Greece. This paper reports on the sessions of the IAPWS Working Group "Power Cycle Chemistry" and other power plant chemistry-related activities of the IAPWS. Included are a review of the current priority list (a list of areas considered by the working group members to need basic research), a summary of the conclusions of the 2004 international collaboration project initiated by the Working Group, summaries of the research presentations given during the meeting, a list of the presentations made during the focused topic discussions, a summary of the Working Group's plans for the coming year, and a list of the presentations made at the IAPWS Symposium on Applied Water Treatment Processes for Power Plant Cycles.

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Sampling of Particulates in the Water/Steam Cycle

Karol Daucik

Analysis of particulate components in the water/steam cycle is an important issue in the chemical control of fossil and nuclear power plants. Sampling is the most difficult part of this issue. In this paper significant parameters affecting the quality of the sample are discussed and their importance is demonstrated by field investigations. The author emphasizes the importance of turbulence through the sample line during isokinetic sampling. Well-designed sampling devices and sampling procedures are prerequisites for reliable sampling of particulates.

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Development of a Gluconate Ion Selective Electrode for Gluconate Measurement in the Boiler Water

Kazuo Marugame, Li-Bin Niu, and Hiroshi Takaku

To develop an gluconate ion selective electrode for the measurement of the gluconate ion concentration, sensitive liquid ion exchangers were incorporated into a polyvinyl chloride membrane to form a gluconate ion selective electrode. The newly developed electrode showed a linear response to the gluconate ion activity between $10^0 \text{ mol} \cdot \text{dm}^{-3}$ and $10^{-4} \text{ mol} \cdot \text{dm}^{-3}$, and the average potential change in this concentration region was -51 mV , when tridodecylmethylammonium gluconate was used as the ion exchanger. The selectivity coefficients of the electrode for various anions were determined with the mixed solution method. The electrode showed a constant potential in the pH range of 4 to 10, and also exhibited a steady potential within 3–10 s after a gluconate concentration change of $10 \cdot 10^{-3} \text{ mol} \cdot \text{dm}^{-3}$ to $5.5 \cdot 10^{-3} \text{ mol} \cdot \text{dm}^{-3}$ in an aqueous solution.

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On-Line Chemistry Analysis of Stator Coolant Systems

Eric V. Maughan

Water-cooled generator stator systems with copper conductors suffer from plugging with corrosion products, which invariably leads to localized overheating. To avoid plugging, the correct chemistry and subsequent monitoring of the core parameters must be carried out. This paper focuses on the in-line measurement of essential chemical variables in the stator coolant water.

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The Langelier Saturation Index: Further Development

Vitaly A. Prisyazhniuk

A simplified technique has been worked out to calculate the Langelier saturation index as an index of the corrosive and scale-forming properties of water. To perform the calculations it is necessary to know the total alkalinity of the water, its electrical conductivity, and pH. A method is presented for making semi-quantitative estimation of the water scaling capacity based on the thickness of the deposits formed. To calculate the thickness of the scale layer it is necessary to know the conductivity of the water at room temperature and the "operative" temperature of the surface on which scale formation is expected.

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