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SOLUBILITY OF COBALT IN PRIMARY CIRCUIT SOLUTIONS

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Objectives: The solubility of cobalt ferrite (CoFe_2O_4) was measured in PWR primary circuit conditions in the temperature range 250-350°C. The results were compared with the ones obtained on magnetite and nickel ferrite.

Comments: It was found that in prevailing primary circuit conditions, the solubility of the cobalt ferrite was minimum at temperatures around 300°C. The equilibrium iron concentration is significantly lower than in the case of magnetite. The results are discussed in relation with the POTHY code, based only on thermodynamic laws and data, which was used for the prediction of the primary circuit chemistry.

Remarks/Potential for dose limitation: The agreement generally observed between equilibrium constants issued from experimental data and from direct calculation by POTHY confirm the validity of this code for any application in the primary circuit chemistry.

References: Lambert, I. and Joyer, F., "Solubility of Cobalt in Primary Circuit Solutions," *Water Chemistry of Nuclear Reactor Systems 6*, Vol. 1, pp. 196-197, British Nuclear Energy Society, London, 1992.

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