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Discussion

CLARENCE JACKLIN.[5] The authors are to be congratulated on the excellent design of their test apparatus for determining silica carry-over and their careful and precise test procedure. The relatively precise results indicate all the factors which influence silica carry-over were well controlled in this test work. The data also covers the full range of pressure, pH, and silica concentrations likely to be encountered in boilers where silica carry-over is a problem. These results are an important addition to the fundamental knowledge on this subject.

In Fig. 4 of the paper the authors show the straight-line distribution ratio proposed by Jacklin and Browar along with curves from their own results and points from Straub and Grabowski's work. The writer would like to offer a word of explanation about the straight-line distribution ratio. It was originally based on the assumption that values of silica in the steam from our experimental boiler were low because of steam washing. Later calculations and the authors' data show the error of this assumption. The writer considers the authors' curves to be a much more accurate representation of the distribution ratio than the straight line originally proposed by Jacklin and Browar.

It would be interesting to know if the presence of other common boiler-water salts such as chloride, phosphate, sulphite, and sulphate would have any action on the effect of pH on silica carry-over in the authors' equipment. These salts were present in Jacklin and Browar's tests and absent in Straub and Grabowski's and the authors' tests.

The use of radioactive-tracer techniques for detecting mechanical carry-over is an interesting new approach to this problem.

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AUTHORS' CLOSURE

The authors gratefully acknowledge Mr. Jacklin's remarks concerning the test apparatus and procedure.

During the planning stages of this research project the authors carefully considered the composition of synthetic boiler waters to be used for the tests and recognized the possibility of effects of common boiler-water salts, such as chloride, phosphate, sulphite, and sulphate, on silica carry-over. However, the silica carry-over problem is known to be most severe at high pressures, at which the concentrations of boiler-water salts are normally held at very low values, and their effects should thus be minimized. Therefore, in order to avoid a time-consuming program of testing the large number of possible combinations, it was decided to limit the test program to solutions of caustic and sodium silicate.

Tests on a number of full-size boilers containing various combinations and concentrations of salts in the boiler water have produced silica carry-over results which are in excellent agreement with the laboratory results. Consequently, the authors have concluded that, if silica carry-over is affected by boiler-water salts other than those used in the laboratory tests, the effects are minor and do not significantly alter the values reported.