

## Evaluation of quality, scaling and corrosion potential of groundwater resources using stability index; case study Kerman Province (Iran)

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### ABSTRACT

The objective of this descriptive and cross-sectional study was to evaluate the scaling and corrosion potential of groundwater resources of Kerman province (southeast of Iran) in 2015. The values of quality factors including carbonate, bicarbonate, calcium, magnesium, sodium, chloride, sulfate, hardness, alkalinity, pH and temperature were obtained and the Langelier, Ryznar, Puckorius and Aggression indexes were computed and corrosion and scaling potential of the groundwater resources were assessed. The results of this study showed that the most values of physical and chemical parameters were in the range of favorable limit to higher than permissible limits, except pH and temperature which were in the favorable limit. The concentration of sulfate, chloride, and sodium was higher than the standard limit at 34.48%, 31.03%, and 51.72% of samples, respectively. The results of this study showed that the index values in most of the studied areas were placed in the corrosion limits and the average of Langelier, Ryznar, Puckorius, and Aggression index were less than zero, >7.5, >6, and 10 to 12, respectively. The difference between corrosion and scaling potential was analyzed by the Chi-squared test and the results illustrated that most of the studied sites were classified in the corrosive group. The results of this study disclosed that the effects of sulfate and chloride concentration on the water quality, scaling, and corrosion potential were higher than other factors. The comparison of water stability indexes showed that the groundwater resource of Kerman province was corrosive. Therefore, it is suggested that the practice of continuously checking the important parameters and adjusting pH of water resources using lime could be proposed in order to control the corrosion phenomena.

*Keywords:* Corrosion; Scaling potential; Stability index; Groundwater resources; Kerman province

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