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Answer to the comments made by Ruiz-Bevia et al. on "Nitrates removal from polluted aquifers using (Sn or Cu)/Pd catalysts in a continuous reactor"

Ruiz-Bevia et al., comment that the data in Table 2 of paper [1] "appear to be incomplete, in the sense that the waters have not been properly characterized", mentioning that not all the ionic species present in the water, as Na^+, K^+ and HCO_3^- are analyzed. In our opinion the water was properly characterized, although not all the ion species concentrations were reported in the paper. This is a usual practice in the scientific papers were only those data which are significant for the discussion of the results are included. In this way we gave the concentration of the ionic species involved with the catalyst deactivation such as Ca^{2+}, Cl^- and SO_4^{2-} and of course, the concentration of the reactant (NO_3^-). In fact, to give the complete composition of the natural water would result in a Table with around 100 entries that would be even more for an industrial wastewater. This would introduce unnecessary data noise. Generally, to have an idea of the total ionic concentration, the total conductivity of the water is given, as we did in the paper.

Following with the comments raised by Ruiz-Bevia et al. about the importance of determining the initial HCO_3^- content of the water, because its possible inhibitor effect, it is clearly indicated in the paper, that the experiments were carried out with a 1:1 mixture of CO_2 and H_2. The presence of a continuous flow of CO_2 will form the corresponding (CO_2)–H_2CO_3/HCO_3^- buffer that maintains the pH of the solution around 6.2. The HCO_3^- concentration during the reaction is determined by this equilibrium, nevertheless the initial HCO_3^- content of the different waters was 160 mg/L for waters B and C, 120 for water A and 40 for water D.

Another comment raised by Ruiz-Bevia et al. regards to the commercial use of this technique. It is his well-known opinion against this technique [2,3], but this does not mean that this topic should not be investigated. Our opinion is clearly reflected in Ref. [4] where we answered him to the same comment.

About the specific remarks made in his comments to our paper:

(a) NO_2^- was not detected in the water, for this reason it has not been reported.
(b) The conversion of selectivity towards concentration is trivial from the data given in the paper. In addition, the use of selectivity is more appropriated for catalytic studies, for this reason we will keep using this parameter.
(c) The selectivity of the different catalysts tested is clearly indicated in Fig. 3 of [1] and we did no observe any change in the selectivity of the reaction as consequence of the different type of water used.

Finally we would like to point out that the results obtained in [1] show that it is possible to improve the selectivity for the reduction of nitrates in water using a Pd–Sn catalyst. This catalyst is active even using different type of polluted waters. Nevertheless, for obtaining drinking water from the nitrate polluted water, a higher selectivity should be obtained. We are aware of this but we are not discouraged because of this as we and many other scientists working in this subject are keeping our efforts in improving the selectivity of the reaction.

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