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## S15: Ingeniería Química y Medioambiente

**REACTION LAG-PHASE IN THE CWPO OF 4-NITROPHENOL SOLUTIONS WITH P-DOPED CARBON BLACK CATALYSTS**

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Previous works have demonstrated that Chemviron Carbon Black (CB) is a catalyst capable to combine a good activity with an adequate stability for long term use and high efficiency of  $H_2O_2$  consumption in the catalytic wet peroxide oxidation (CWPO) process [1]. Phosphorous doping was now used as a mean to increase the catalyst performance. To assess catalytic activity the CWPO of 4-nitrophenol (4-NP) was carried out under the referred conditions. 4-NP was monitored by HPLC, as described previously [2]. Experiments at 50 °C evidenced that the oxidation of 4-NP starts only after 2 h with 4-nitrocatechol (4-NC) identified as intermediate. Several hypotheses have been proposed including the need for a redox starter such as 4-nitrocatechol (4-NC). However, adding 4-NC to the initial solution did not affect the initial reaction lag-phase (Fig. 1-A). Thus, the presence of 4-NC is not the trigger to start 4-NP oxidation. On the other hand, a temperature increment or a decrease of the initial pH, led to elimination of the lag-phase, while complete conversion of 4-NP was achieved after 8 h (Fig. 1-B).

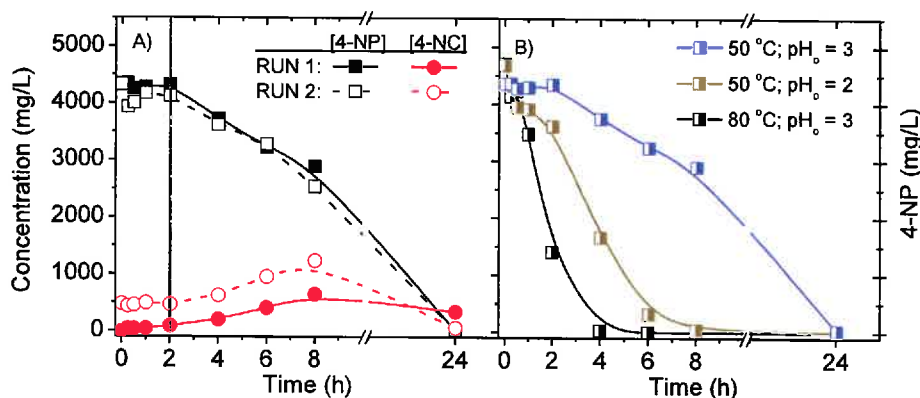


Figure 1. (A) 4-NP and 4-NC concentration evolution in CWPO runs with P-doped CB (2.5 g/L), the stoichiometric amount of  $H_2O_2$ ,  $pH_0 = 3$ ,  $T = 50$  °C and without (RUN I) or with (RUN 2) 4-NC at the beginning of reaction; (B) 4-NP concentration evolution at the conditions in (A), except temperature and  $pH_0$ .

**References**

- [1] J.L. Díaz de Tuesta, C.M. Domínguez, A. Quintanilla, J.A. Casas, J.J. Rodríguez, *ANQUE ICCE BIOTEC 2014 CONGRESS* (Spain).
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