ENVIRONMENTALLY FRIENDLY EFFICIENT SYNTHESIS AND MECHANISM OF DYES DERIVED FROM 2-HYDROXY BENZOIC ACIDS ON CLAYS, ZEOLITES

T. Abbas[1], H.A. Dabbagh[2], A.N. Chermahiniand[3]

1 - Payame Noor University, Isfahan, Iran
2 - Department of Chemistry, Isfahan University of Technology, Isfahan, Iran
3 - Department of Chemistry, Yasouj University, Yasouj, Iran
a_teimouri@alumni.iut.ac.ir

The formation of diazotizing reagent starts with protonation of nitrous acid under strongly acidic conditions, and azo coupling carried out at low temperature in the presence of nucleophilic coupling components, the reactivity of a nucleophilic substrate increases with increasing basicity phenolates and amines [1]. These conventional acid–base catalyzed processes are effective for the near quantitative formation of the desired products. But the main limitation of such synthetic processes is their environmental incompatibility. The acidic and basic effluents from the laboratory and industry produce permanent damage to the environment and disturb the ecological balance [2]. Clays have long been used as acidic catalysts and existence of both Lewis and Bronsted acid sites. These clays are low-cost, widely available materials, and synthetic organic chemists have largely used them in a variety of acid-catalysed reactions [3]. Diazotization and diazocoupling reactions of para-aminobenzene-1-sulfonyl azide with a series of salicylic acid derivatives as the coupling component. over eco-friendly clay catalysts, and Zeolites are described. These inexpensive, noncorrosive and reusable catalysts were found to exhibit bifunctional catalytic properties for these reactions. No considerable decreases in the efficiency of the catalysts were observed after four cycles of operation. The new method totally avoids the use of acid, alkali or toxic solvents in diazotization and diazotizing reactions.

[1] H. Zollinger, Color chemistry, 3rd Edn, Yelag Helvetica Chimica Acta, Switzerland, 2003, 165.
[2] J. H. Clark, Chemistry of Waste Minimization, Ed. Chapman and Hall: London, 1995.
[3] (a) K. Motokura, N. Fujita, K. Mori, T. Mizugaki, K. Ebitani, K. Kaneda, J. Am. Chem. Soc. (Communication); 127 (2005) 9674-9675. (b) Y. Izumi, K. Urabe, M. Onaka, Microporous and Mesoporous Materials 21 (1998) 227-233. (c) B.M. Choudary, V. Bhaskar, M. Lakshmi Kantam, K. Koteswara Rao, K.V. Raghavan, Green Chem. 2 (2000) 67-70.
(d) R. Ballini, G. Bosica, R. Maggi, M. Ricciutelli, P. Righi, G. Sartori, R. Sartorio, Green Chem. 3 (2001) 178-180. (e) L. Jankovic, P. Komadel, J. Catal. 218 (2003) 227-32. (f) D. Tichit, F. Fajula, F. Figuras, J. Bousquet, C. Gueguen, in: B. Imelic, et al. (g) J.H. Clark, D.J. Macquarrie, Org. Process Res. Dev.1 (1997) 149-162.