

## Synthesis and characterization of MCM-48@Dithizone@Ni and its catalytic activity in the synthesis 2-phenyl benzimidazole derivatives

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One of the fastest-developing areas in molecular sieve science is the synthesis of transition-metal-containing molecular sieves. Since the discovery of periodic mesoporous silica M41S materials in 1992 [1], a wide variety of new materials have been synthesized to exploit the ability of these substrates to act as hosts of inorganic and organic species. The most widely researched members of the M41S family are MCM-41 and MCM-48. MCM-48 consists of a cubic array with a three-dimensional pore network. Whereas mesoporous M41S silicate materials do not exhibit flexible oxidation state behavior, the capacity of transition metals to have variable oxidation states expands the potential of M41S materials to be used in catalytic applications [2].

In this work, mesoporous MCM-48 was synthesized and modified with 3-chloropropyltrimethoxysilane. Then dithizone groups was immobilized on modified MCM-48 and finally nickel metal was fabricated on its surface (MCM-48@Dithizone@Ni). The structures of the MCM-48@Dithizone@Ni was determined using various techniques such as SEM, EDS, WDX, TGA, XRD, BET and FT-IR. An important characteristic of the MCM-48@Dithizone@Ni catalyst is that very stable without a considerable decrease in their catalytic performance after five cycles.

**Keywords:** MCM-48, nickel, nanocatalyst, dithizone

### References

- [1] C.T. Kresge, M.E. Leonowicz, W.J. Roth, J.C. Vartulli, J.S. Beck, *Nature*, **1992**, 359, 710.
- [2] J.Y. Ying, C.P. Mehnert, M.S. Wong, *Angew. Chem*, **1999**, 38, 56.