

INFORMATION ON DOCTORAL THESIS

1. Full name: ***Vu Thi Hau***
2. Sex: female
3. Date of birth: 16/10/1976
4. Place of birth: Thai Nguyen, Viet Nam
5. Admission decision number: 2385/SĐH dated: June 29th 2007 by President of Vietnam National University, Hanoi.
6. Changes in academic process: none
7. Official thesis title: "Investigation on preparation of catalyst for catalytic wet air oxidation and application for treatment of biologically persistent wastewater"
8. Major: Physical and theoretical chemistry
9. Code: 62.44.31.01
10. Supervisors: Assoc.Prof. Dr Cao The Ha
11. Summary of the new findings of the thesis:

It was revealed that Vietnamese transition metal ores have certain catalytic activity in catalytic wet air oxidation (CWAO) process. Heat treatment did not increase reactivity significantly.

The Mn-ore showed the highest activity in color removal, but low in COD removal; addition of Fe and Cu produced two- or three-component catalysts with higher activity regarding to COD removal. Catalyst containing Cu showed relatively high activity in terms of both color and COD removal, it was chosen to be applied in oxidation of the real wastewater from dye house in soft reaction conditions. The results made a contribution to diversify the catalyst's list for CWAO treating textile wastewater in particular, and wastewaters containing biologically persistent organic substances in general.

The real dye house wastewater treated by CWAO increased its BOD/COD ratio from 0.2 up to 0.5-0.6, therefore the CWAO may be proposed as a pre-treatment step followed by conventional biological treatment in an integrated scheme for treatment of such a kind of biologically persistent wastewater.

12. Practical applications:

Mn-ore as well as modified Mn-ore containing Fe, Cu can be used as catalysts of wet air oxidation treating textile wastewater containing reactive dyes.

13. Further research directions:

Continue research on the CWAO to treat wastewaters containing color and/or persistent organic compounds such as wastewaters from paper and aluminum industries etc.

14. Thesis-related publications:

[1]. Vu Thi Hau, Cao The Ha, Vu Ngoc Duy (2010), "Screening of catalytic activities of natural ores in wet air oxidation process for dye-stuff treatment", *Journal of science and technology - Viet Nam academy of science and technology* 48(2A), pp. 235-242.

[2]. T.H Cao, T.M Nguyen, T.H Vu, N.D Vu (2010), "Study on pre-treatment of dyeing wastewater by Wet Air Oxidation and Fenton Oxidation", *Southeast Asian Water Environment* 4, pp. 93 – 100.

[3]. Vu Thi Hau, Vu Ngoc Duy, Cao The Ha (2010), "An overview on application of Wet Air Oxidation in wastewater treatment", *the sixth scientific conference of Hanoi University of Science- Hanoi National University*, pp. 82- 90.

[4]. Vu Thi Hau, Vu Ngoc Duy, Cao The Ha (2011), "Catalytic activity of *Pyrolusite* ore for decolourization of RB19 dye stuff in Wet Air Oxidation", *Journal of Analytical Sciences* 14, pp. 15-18.

[5]. Vu Thi Hau, Vu Ngoc Duy, Cao The Ha (2011), "Screening of catalytic activities of some preparation catalysts on the basis of iron oxide, manganese oxide in wet air oxidation process for dye-stuff treatment", *Journal of chemistry* 49(3A), pp. 327 – 332.

[6]. Vu Thi Hau, Vu Ngoc Duy, Cao The Ha (2011), " Kinetics of some reactive dyes decolorization in catalytic wet air oxidation (CWAO) process using modified Cao Bang pyrolusite catalyst", *Journal of chemistry* 49(2ABC), pp. 272 – 276.

[7]. Cao The Ha, Vu Thi Hau (2011), " The lifetime, generation and reuse ability of catalyst in wet oxidation (WO) treating dyed wastewater ", *Journal of chemistry* 49(5AB), pp. 267 – 275.