

Abstract**TITLE OF INVENTION: TUNGSTEN-MODIFIED HZSM-5 CATALYSTS
AND METHODS FOR THEIR PREPARATION**

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The present invention aims to solve the technical problems related to the performance of HZSM-5 catalyst, especially in catalyzing the dehydration reaction of alcohol to ethylene, ether and/or unsaturated hydrocarbons. This objective is achieved through a method for preparing HZSM-5 catalyst impregnated by a tungsten-containing compound with the following steps:

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a. heating a HZSM-5 material at a temperature of 50-60°C in a vacuum with a pressure of -0.5 bar,

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b. dripping phosphotungstic acid solution into the HZSM-5 material at a temperature of 50°C to impregnate the tungsten metal from the phosphotungstic acid into the HZSM-5 material with a metal content ratio of 0.1 to 2% weight/weight,

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c. keeping the impregnated catalyst for 24 hours at room temperature and atmospheric pressure,

d. drying the impregnated catalyst in an oven for 24 hours at a temperature of 60-70°C, and

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e. calcining the impregnated catalyst by heating at a heating rate of 2°C/minute until it reaches a temperature of 350°C and then keeping the catalyst for a certain time at a temperature of 350°C.

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The tungsten-containing compound is preferably phosphotungstic acid, the metal content ratio mentioned in step b is preferably 0.9 to 1.1% wt/wt, and the Si/Al ratio of the HZSM-5 material is preferably in the range of 32-38.

Figure 1