CLAIMS

1. A method for preparing a catalyst, said method comprising:

(a) impregnating a support comprising from 75 wt% to 99 wt% titanium dioxide and from 1 wt% to 25 wt% tungsten trioxide with a palladium compound, a gold compound, and an optional alkali metal or ammonium compound;

(b) calcining the impregnated support; and

(c) reducing the palladium and gold compounds to metals to yield from 0.1 wt% to 3 wt% palladium and from 0.1 wt% to 3 wt% gold in the catalyst, wherein the weight ratio of palladium to gold is the range of 5:1 to 1:3.

2. The method of claim 1 wherein the palladium compound is selected from the group consisting of palladium chloride, sodium chloropalladite, palladium nitrate, palladium sulfate, and mixtures thereof, and the gold compound is selected from the group consisting of auric chloride, tetrachloroauric acid, sodium tetrachloroaurate, and mixtures thereof.

3. The method of claim 1 wherein the support comprises from 85 wt% to 95 wt% of titanium dioxide and from 5 wt% to 15 wt% of tungsten trioxide.

4. The method of claim 1 wherein the calcination is performed at a temperature within the range of 100°C to 600°C.

5. The method of claim 1 wherein the reduction is performed at a temperature within the range of 300°C to 600°C in the presence of hydrogen.