Claims

1. A method for synthesizing 5-amino-2,4-dihydroxybenzoic acid (DHBA), comprising the steps of:

   (1) using resorcinol as a raw material to obtain 2,4-DHBA through Koble-Schmitt reaction;

   (2) nitrating 2,4-DHBA to obtain 5-nitro-2,4-DHBA; and

   (3) reducing 5-nitro-2,4-DHBA to obtain a product 5-amino-2,4-DHBA.

2. The method for synthesizing 5-amino-2,4-DHBA according to claim 1, wherein step (1) comprises the steps of:

   mixing resorcinol, alkali and solvent water, introducing CO_2, raising the temperature to 40-120℃ and reacting for 2-7 h, and post-treating the reaction liquid to obtain 2,4-DHBA; and

   a molar ratio of the resorcinol to the alkali is 1:1 to 10.

3. The method for synthesizing 5-amino-2,4-DHBA according to claim 2, wherein the alkali is sodium bicarbonate or potassium bicarbonate.

4. The method for synthesizing 5-amino-2,4-DHBA according to claim 2, wherein the post-treatment method comprises the steps of: after completion of the reaction, cooling the reaction liquid to room temperature, stopping the introduction of CO_2, filtering, adjusting the pH of a filtrate with concentrated hydrochloric acid to 1, precipitating a solid, cooling with ice water and suction filtering to obtain a crude product, recrystallizing and purifying the crude product with distilled water, and drying the purified solid to obtain 2,4-DHBA.

5. The method for synthesizing 5-amino-2,4-DHBA according to claim 1, wherein step (2) comprises the steps of:

   dissolving 2,4-DHBA in an organic solvent, dropwise adding concentrated nitric acid, reacting at 20-75℃ for 1-7 h after dropwise, and post-treating the reaction liquid to obtain 5-nitro-2,4-DHBA; and

a molar ratio of 2,4-DHBA to the nitric acid is from 1:1 to 6.

6. The method for synthesizing 5-amino-2,4-DHBA according to claim 5, wherein the organic solvent is acetonitrile or acetic acid.

7. The method for synthesizing 5-amino-2,4-DHBA according to claim 5, wherein the post-treatment method comprises the steps of: pouring the reaction liquid into a beaker filled with distilled water or crushed ice after completion of the reaction, quenching the reaction to precipitate a solid, filtering, and drying a filter cake to obtain 5-nitro-2,4-DHBA.

8. The method for synthesizing 5-amino-2,4-DHBA according to claim 1, wherein step (3) comprises the steps of:

mixing 5-nitro-2,4-DHBA, palladium carbon and solvent, dropwise adding hydrazine hydrate, reacting at 40-85℃ for 1-6 h after dropwise, and post-treating the reaction solution to obtain a product 5-amino-2,4-DHBA;

a molar ratio of 5-nitro-2,4-DHBA to the hydrazine hydrate is from 1:1 to 10; and a mass ratio of the 5-nitro-2,4-DHBA to the palladium carbon is 1:0.02-0.1, and a content of palladium (Pd) in the palladium carbon is 5-10 wt%.

9. The method for synthesizing 5-amino-2,4-DHBA according to claim 8, wherein the solvent is methanol, ethanol or tetrahydrofuran.

10. The method for synthesizing 5-amino-2,4-DHBA according to claim 8, wherein the post-treatment method comprises the steps of: after completion of the reaction, filtering the reaction solution while the reaction solution is hot, cooling a filtrate in an ice water bath, adding stannous chloride and concentrated hydrochloric acid, standing for 5-6 h, suction filtering, and drying a filter cake to obtain a product 5- amino-2,4-DHBA; a mass ratio of stannous chloride to 5-nitro-2,4-DHBA is 0.01 to 0.03:1; and a volume dosage of the concentrated hydrochloric acid is 10-40 mL/g based on a mass of 5-nitro-2,4-DHBA.