Abstract

The present invention discloses a fluorescent probe for detecting nitroreductase and a preparation method and use thereof in enzymatic reactions, belonging to the field of industrial analysis and detection. The probe is 3-(4-(2-(4'-(diphenylamino)-3-((4-nitrobenzyl)oxy)-[1,1'-biphenyl]-4-yl)vinyl)quinolin-1-ium-1-yl) propane-1-sulfonate. As for the probe of the present invention, with the introduction of hydrophilic groups, sulfonate and quinolinium, the probe's hydrophilicity is enhanced, under the enzymatic catalysis of nitroreductase (NTR), 1,6-rearrangement and elimination reaction occurs, and hydroxyl group is generated. Detection and analysis of the NTR in the industrial enzymatic reactions can be realized due to the change of fluorescence which is induced by the intramolecular charge transfer (ICT) effect. This method has such advantages as easy preparation, high yield and being suitable for detecting high concentration of enzyme in the enzymatic reactions, and it shows an extensive application prospect in the field of enzyme-detection in the industrial enzymatic reaction systems.