عنوان مقاله:

A sensitive and fast detection of Ascorbic Acid based on nitrogen-doped graphene quantum dots as fluorescent probe

محل انتشار:

سومین کنگره ملی شیمی و نانوشیمی از پژوهش تا فناوری (سال: 1399)

تعداد صفحات اصل مقاله: 4

نویسندگان:

Rouhollah Khani - *Assistant Professor, Department of Chemistry, College of Sciences, University of Birjand*

Seyed Mahdi Nurbakhsh - *MSc Student, Department of Chemistry, College of Sciences, University of Birjand*

خلاصه مقاله:

Ascorbic acid (AA), also known as vitamin C, is one of the basic vitamins significantly essential for humans and animals in biological systems and plays a considerable role in many life processes including amino acid metabolism, collagen formation and ion absorption. A rapid, selective and sensitive probe based on the Fe(III) modulated nitrogen-doped graphene quantum dots (N-GQDs) was developed and applied as fluorescence probe for AA detection. This procedure involves synthesis via the pyrolysis of citric acid, as a source of carbon, and tris-hydroxymethylaminomethane, as a surface passivation agent. To examine the most important parameters including volume of N-GQDs, pH of thesolution, ultrasonic time, ionic strength and their interactions on the fluorescence intensity, a four factor central composite design (CCD) combined with response surface modeling (RSM) was implemented. Under optimal conditions, the method showed a response to AA within a concentration range of ۳.۰– ۷۰ μmol L–۱ with a good linear relationship and the relative standard deviation for AA was ۴.۲%. The developed probe was successfully applied for the determination of AA in beverage samples with quantitative recoveries from ۹۵.۰ % to ۱۰۲.۳ %..

کلمات کلیدی:

Ascorbic acid, Nitrogen-doped graphene quantum dots, Fluorescence probe, Experimental design