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Highlights

 $Bi_2MoO_6/g-C_3N_4$ composites were synthesized by a mixed-calcination method.

The $Bi_2MoO_6/g-C_3N_4$ photocatalyst exhibits much better photocatalytic performance.

The enhanced photocatalytic activity is attributed to the hetrojunction structure.

Holes (h^+) and superoxide radicals ($\bullet O^{2^-}$) serve as the two main active species.

Graphical abstract



Mixed-calcination synthesis of $Bi_2MoO_6/g-C_3N_4$ heterojunction with enhanced visible-light-responsive photoreactivity for RhB degradation and photocurrent generation

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ABSTRACT: Organic-inorganic hybrid photocatalyst Bi2MoO6/g-C3N4 was synthesized via a mixed-calcination route based on intimate interfacial interaction. The successful combination of $g-C_3N_4$ and Bi_2MoO_6 was verified by X-ray diffraction (XRD), Fourier-transform infrared spectra (FTIR), scanning electron microscopy (SEM) and energy dispersive X-ray (EDX) mapping. The optical property of the as-prepared photocatalysts was characterized by UV-vis diffuse reflectance spectra (DRS). The photocatalytic activities were investigated by degradation of Rhodamine B (RhB) and photocurrent generation under visible-light ($\lambda > 420$ nm). The results demonstrated that the Bi2MoO6/g-C3N4 composite exhibits highly enhanced photoreactivity compared to the pristine samples. It should be attributed to the fabrication of a Bi₂MoO₆/g-C₃N₄ heterojunction, thus resulting in the high separation and transfer efficiency of photogenerated charge carriers, as confirmed by the photoluminescence (PL) and electrochemical impedance spectra (EIS). The active species trapping experiments indicated that holes (h^+) and superoxide radicals ($\bullet O_2^-$) are the main active species in the degradation process.

Keywords: A. layered compounds; A. semiconductors; B. chemical synthesis; C. impedance spectroscopy; D. catalytic properties

1 Introduction

Nowadays, the problems on environmental deterioration and energy shortage have been bothering people, and green chemistry has become a necessary requirement for the sustainable development of human society. Among the various green techniques, semiconductor photocatalysis has emerged as one of the most promising technologies because the semiconductor photocatalyst can use the solar energy for degradation of organic contaminants [1-3]. In order to achieve the above goals, two problems must be resolved, increasing the separation efficiency of photoexcited electron-hole pairs and extending the excitation wavelength range of photocatalysts. To extend the absorption-wavelength range, the semiconductor materials, such as oxides, sulfides and nitrides etc., which can be excited by visible light, have been investigated extensively. However, a single-phase photocatalyst exhibits significant limitations in the process of photocatalytic reactions due to the quick combination of photogenerated electrons and holes. To enhance the separation efficiency of photoexcited charge carriers, fabrication of heterojunction photocatalysts have been extensively investigated [4,5].

Recently, a polymer photocatalyst named graphitic carbon nitride $(g-C_3N_4)$ has attracted intensive attention for hydrogen gas evolution via water splitting, photocatalytic degradation of organic pollutants and photosynthesis under visible light illumination [6-8]. It is known that the band gap of $g-C_3N_4$ is about 2.7 eV, which can absorb visible light with wavelength up to 459 nm. Furthermore, the conduction band (CB) minimum (-1.13 eV vs. NHE) of $g-C_3N_4$ is extremely

negative, so photogenerated electrons should have a strong reduction ability. However, the photocatalytic efficiency of single $g-C_3N_4$ is limited due to the insufficient visible-light absorption and high recombination probability of photoexcited electron-hole pairs. In order to improve the photocatalytic activity of $g-C_3N_4$, many strategies such as doping and coupling with other semiconductor materials have been used to modify $g-C_3N_4$ [9,10].

Bismuth molybdate compounds are a kind of important catalyst materials, which have been widely used in the preparation of selective oxidation of propylene dehydrogenation propylene aldehydes, propylene ammoxidation preparation nitrile, etc. In addition, these compounds can also serve as ion conductor, audio and video materials, optical conductor and gas sensor due to its unique physical properties. Recent studies have shown that Bi_2MoO_6 possesses excellent visible light photocatalytic properties [11,12]. Its crystal structure consists of alternating $[Bi_2O_2]^{2^+}$ layers and MoO₆ octahedral perovskite layers. It has been reported that in the crystal structure of a layered compound, the separation and migration of charge carrier are much easier, thus resulting in high photocatalytic activity [13,14]. Recently, Li etc. reported the synthesis of g-C₃N₄/Bi₂MoO₆ composites by a solvothermal method [15]. However, the above composites may fail to achieve controllable compositing degree and strong interfacial interaction.

In this work, we successfully prepared the heterostructural photocatalyst of $Bi_2MoO_6/g-C_3N_4$ by a mixed-calcination method, which may provide a more reliable interfacial interaction between $g-C_3N_4$ and Bi_2MoO_6 . The photocatalytic

activity of the Bi₂MoO₆/g-C₃N₄ was evaluated by decomposing RhB and photocurrent generation under visible light irradiation ($\lambda > 420$ nm). The Bi₂MoO₆/g-C₃N₄ composite exhibits superior RhB photodegradation rate and photocurrent response, which should be attributed the efficient separation of photoinduced charge carriers originated from the Bi₂MoO₆/g-C₃N₄ heterojunction fabrication. The structure, optical property and photocatalytic mechanism of the as-prepared photocatalysts are investigated in details.

2 Experimental

2.1. Synthesis of heterostructured Bi₂MoO₆/g-C₃N₄ photocatalyst

All chemicals were used in analytical grade without further purification. The $g-C_3N_4$ precursor was synthesized through pyrolysis of melamine in a crucible without a cover under ambient pressure in air [16]. The details are as follows: The melamine was added in a crucible and heated to 520 at a heating rate of 3 min⁻¹ in a tube furnace for 4h. After cooling to room temperature, the yellow product was collected and milled into powder.

Pure Bi_2MoO_6 was prepared by hydrothermal method: Firstly, 0.004 mol of $Na_2MoO_4 \cdot 2H_2O$ was totally dissolved in 25 mL of distilled water to form solution A. Secondly, 0.008 mol of $Bi(NO_3)_3 \cdot 5H_2O$ was dissolved in the A solution. Then, the resultant mixture was sealed in a 50 mL Teflon-lined stainless steel autoclave, and heated and maintained at 180 \Box for 12 h, then cooling to room temperature. After funnel separation, the powder was washed with water for several times and then

dried at 80 in a vacuum oven.

The Bi₂MoO₆/g-C₃N₄ composites were prepared through a mixed-calcination method at 400 \therefore 0.0005 mol g-C₃N₄ and 0.0015 mol Bi₂MoO₆ were both dissolved in 50 ml of ethanol under ultrasonic oscillation for 1 h, and then dried in the oven at \therefore The mixed powder was collected and calcined at 400 for 0.5 h to obtain the 1:3 Bi₂MoO₆/g-C₃N₄ photocatalyst. Other Bi₂MoO₆/g-C₃N₄ photocatalysts with the molar ratio of 1:5, 1:1 and 3:1 were prepared by the same method.

2.2. Characterization

The phase structures of photocatalysts were investigated by X-ray powder diffraction (XRD) analysis at room temperature on a XRD powder diffraction instrument with monochromatized Cu K α radiation (λ = 1.5406 nm) at a setting of 40 kV and 40 mA. And the Scanning rate and range were 0.02° (2 θ)/s and 10-70°, respectively. Fourier-transform infrared (FTIR) spectra were obtained using a Bruker spectrometer in the frequency range of 4000-500 cm⁻¹. The morphologies and microstructures of the photocatalysts were studied by field emission scanning electron microscopy (SEM) (Hitachi S-4800). UV-vis diffuse reflectance spectra (DRS) were recorded on a Cary 5000 (America Varian) spectrophotometer. The photoluminescence (PL) spectra of the samples were measured using a Hitachi F-4600 fluorescence spectrophotometer to observe the combination rate of electron-hole pairs.

2.3. Photocatalytic activity measurements

The photocatalytic activities of the samples were evaluated by the degradation

of the RhB under visible light irradiation (300 W xenon lamp, $\lambda > 420$ nm). 50 mg of the as-prepared photocatalyst was dispersed into 50 mL of RhB solution (1×10⁻⁵ mol/L). Prior to illumination, the adsorption-desorption equilibrium between photocatalyst powder and RhB was obtained by vigorously stirred for 1h min. And then, the light was turned on, and 2 mL of the suspensions were taken into the centrifuge tubes at selected intervals. The vigorously stirring was maintained throughout the whole reaction process. After that, the photocatalysts in the mixture were removed by centrifugation (4500 r/min, 5 min) and the centrifuged solution was analyzed by recording the maximum absorption band (554 nm for RhB) and UV-vis spectra were recorded by Shimadzu UV-5500PC spectrophotometer (Shanghai Wuxiang Company).

2.4. Active species trapping experiments

The active species, such as hydroxyl radicals (•OH), superoxide radical (•O₂⁻) and holes (h^+) were detected by adding isopropyl alcohol (IPA), 4-benzoquinone (BQ) and disodium ethylenediaminetetraacetate (EDTA), respectively [17,18]. The method was similar to the former photocatalytic activity test with the addition of 1 mmol of quencher in the presence of RhB.

2.5. Photoelectrochemical Measurements.

Photoelectrochemical measurements are carried out in a three-electrode quartz cell (CHI-660E electrochemical system). The working electrodes were photocatalyst films coated on ITO. The saturated calomel electrode (SCE) was the reference electrode, and platinum wire serves as counter electrode. The electrolyte was 0.1 M

 Na_2SO_4 solution All the photoelectrochemical measurements are performed under visible light irradiation from a 300 W Xe lamp with 420 nm cutoff filters.

3 Results and discussion

3.1. Characterization of Bi_2MoO_6/g - C_3N_4 composite photocatalysts

Fig. 1a and 1b depict the crystal structures of g-C₃N₄ and Bi₂MoO₆, respectively. The crystal structure of Bi_2MoO_6 is composed of alternating $(B_{i2}O_2)^{2+}$ cationic layers and interbedded (MoO₆)⁶⁻ tetrahedral layers. Obviously, both g-C₃N₄ and Bi₂MoO₆ possess layered crystal configuration. It is believed that the layered crystal structure can promote the separation of electron-hole pairs and depress the recombination rate of charge carriers. The X-ray diffraction (XRD) patterns of the as-obtained products were shown in Fig. 2. For the XRD pattern of pure C_3N_4 , two pronounced diffraction peaks were observed at 13.2° and 27.5°. The former peak is indexed as the (100) plane corresponding to the interlayer structural packing motif of tristriazine units, while the peak at 27.5° can be ascribed to the (002) plane which is the characteristic peak of inter-planar stacking of conjugated aromatic systems (JCPDS 87-1526) [19]. All the diffraction peaks of Bi₂MoO₆ can be indexed into the pure orthorhombic Bi₂MoO₆ (JCPDS 76-2388) [11]. No impurity peaks were observed, which implies that the final products of $g-C_3N_4$ and Bi_2MoO_6 were of pure phases. Because of the low intensity of the g-C₃N₄, there is no obvious peaks can be detected in Bi_2MoO_6/g -C₃N₄ composites. However, the narrow sharp peaks suggest that the $Bi_2MoO_6/g-C_3N_4$ products are highly crystalline.

Fig. 3 presents FTIR spectra of g-C₃N₄, Bi₂MoO₆, and g-C₃N₄/Bi₂MoO₆ heterojunctions. In the spectrum of g-C₃N₄, the band at around 3294 cm⁻¹ can be assigned as the stretching mode of NH₂ or N-H groups. The bands at 1322 cm⁻¹ and 1633 cm⁻¹ correspond to the C–N and C = N stretching mode, respectively [20]. The peak at 808 cm⁻¹ was assigned to the triazine units, and the bands at 1245 and 1574 cm⁻¹ correspond to the stretching vibration of C–N heterocyclics. For the spectrum of Bi₂MoO₆, the peak at 3430 cm⁻¹ was attributed to O–H vibrations [21]. The FTIR spectrum of the Bi₂MoO₆ mainly exhibits the absorption peaks around at 400-900 cm⁻¹. Absorption bands at 841 cm⁻¹ and 732 cm⁻¹ are attributed to Mo–O stretching vibrations, while the Bi–O stretching and deformation vibrations are located at 565 cm⁻¹ and 450 cm⁻¹. All the absorption bands of g-C₃N₄ and Bi₂MoO₆ can be observed in the spectra of g-C₃N₄/Bi₂MoO₆ composites with molar ratios of 1:1, 1:3 and 1:5. This result demonstrated the successful synthesis of g-C₃N₄/Bi₂MoO₆ composites.

The morphology of g-C₃N₄, Bi₂MoO₆ and 1:3 Bi₂MoO₆/g-C₃N₄ were studied by SEM. From Fig. 4a, the g-C₃N₄ sample clearly showed a layered structure with numerous stacking layers, which was in accordance with the literature report. The Bi₂MoO₆ sample displayed a plate-like structure with a diameter of 100 ~ 500 nm (Fig. 4b). Fig. 4c and 4d revealed that the two types of materials were all found in the sample of 1:3 Bi₂MoO₆/g-C₃N₄. In addition, it was observed that a large number of Bi₂MoO₆ nanoparticles are assembled on the surface of the g-C₃N₄ sheets. For further confirmation, EDX mapping of 1:3 Bi₂MoO₆/g-C₃N₄ was performed (Fig. 5). It is obvious that the C, N, Bi, Mo, and O elements are homogenously distributed in

the bulk structure, confirming that the Bi_2MoO_6 nanosheets are uniformly assembled on the surface of g-C₃N₄.

The UV-Vis diffuse reflectance spectra of the as-prepared samples were presented in Fig. 6, from which the optical absorption edges of the pure $g-C_3N_4$ and Bi_2MoO_6 were roughly estimated from the absorption onset to be 450 and 479 nm, respectively. After the combination of $g-C_3N_4$ and Bi_2MoO_6 , the absorption band edges of the composites gradually shift to that of pure Bi_2MoO_6 with the increase of Bi_2MoO_6 contents, which indicates that Bi_2MoO_6 was a good visible-light sensitizer to $g-C_3N_4$. The band gap (E_g) can be determined by the formula [22]:

$$\alpha hv = A(hv - E_g)^{n/2}$$
(1)

Where α , h, m, E_g and A are absorption coefficient, Planck constant, light frequency, band gap energy, and a constant, respectively. Among them, n is determined by the type of optical transition of a semiconductor (n = 1 for direct transition and n = 4 for indirect transition). As previous literature reported, the n value of g-C₃N₄ was 4, and the n value of Bi₂MoO₆ was 1. From the plot of (α hv)^{1/2} or (α hv)² versus (hv) in the inset of Fig. 6, the E_g of g-C₃N₄ and Bi₂MoO₆ were estimated to be 2.70 eV and 2.59 eV, respectively.

3.2. Photocatalytic reactivity for RhB degradation and photocurrent generation

The photocatalytic activities of the Bi₂MoO₆/g-C₃N₄ composite photocatalysts were examined by degradation of RhB molecules in aqueous solution and photocurrent generation under visible light irradiation ($\lambda > 420$ nm). Fig. 7a shows the photocatalytic degradation of RhB with the prepared photocatalysts under

visible light irradiation for 6 h. It can be seen that both the pure $g-C_3N_4$ and pure Bi_2MoO_6 display relatively poor visible-light induced degradation efficiency. The $Bi_2MoO_6/g-C_3N_4$ photocatalyst with molar ratio of 1:3, displayed the highest degradation efficiency, and about 72% RhB could be removed within 6 h. Besides, the 1:5 $Bi_2MoO_6/g-C_3N_4$ photocatalyst also exhibits a higher photocatalytic activity than those of pure $g-C_3N_4$ and pure Bi_2MoO_6 . The time-resolved absorption spectra were depicted in Fig. 7b. It can be seen that the maximum absorbance of the solution in the visible region shifted from 554 to 530 nm after 6 h irradiation, suggesting that N-demethylation and de-ethylation processes occurred during the photocatalytic reaction.

Photocurrent response can be utilized to monitor the generation and transfer of the photoexcited charge carriers and elucidate the interfacial charge transfer dynamics of a photocatalyst [23,24]. Fig. 8 shows the curves of photocurrent density versus irradiation time over the pristine Bi_2MoO_6 , g-C₃N₄ and 1:3 Bi_2MoO_6/g -C₃N₄ photocatalysts. Under visible light, prompt photocurrent responses are all observed on the three photocatalyst electrodes. Compared with the two single phases, the Bi_2MoO_6/g -C₃N₄ composite exhibits evidently enhanced photocurrent intensity, indicating the higher separation efficiency of photoinduced electrons and holes. Thus, the formation of Bi_2MoO_6/g -C₃N₄ composite can effectively facilitate the separation efficiency of charge carriers in contrast to the pristine photocatalysts.

3.3. Mechanism investigation on the enhanced photocatalytic reactivity

The conduction band (CB) and valence band (VB) positions of g-C₃N₄ and

Bi₂MoO₆ can be calculated by the following empirical formulas [25,26]:

$$E_{VB} = X - E_e + 0.5E_g \tag{2}$$

$$E_{CB} = E_{VB} - E_g \tag{3}$$

where E_{VB} is the VB edge potential; X is the electronegativity of the semiconductor, which is the geometric average of the absolute electronegativity of the constituent atoms (X values of g-C₃N₄ and Bi₂MoO₆ are 4.67 eV and 6.31 eV, respectively); E_e is the energy of free electrons on the hydrogen scale (E_e = 4.5 eV); and E_g is the band gap energy of the semiconductor. The band gap energies of g-C₃N₄ and Bi₂MoO₆ are adopted as 2.70 eV and 2.59 eV, respectively. Calculated by Eq. (1) and (2), the positions of the CB and VB of g-C₃N₄ are -1.13 and 1.57 eV, while those values for Bi₂MoO₆ are 0.52 and 3.11 eV, respectively.

The migration and transfer processes of photogenerated charge carriers in a semiconductor can be investigated via electrochemical impedance spectra (EIS) [23,24]. The arc in the EIS spectra usually indicates the interface layer resistance occurred at the surface of electrode. Fig. 9 presents the Nyquist plots of the Bi₂MoO₆, g-C₃N₄ and 1:3 Bi₂MoO₆/g-C₃N₄ photocatalysts under visible light. It can be found that the arc radius of Bi₂MoO₆/g-C₃N₄ electrode is obviously smaller than pure Bi₂MoO₆ and g-C₃N₄, which demonstrates a higher charge transfer rate occurred in Bi₂MoO₆/g-C₃N₄ composite electrode.

The separation efficiency of the photogenerated electrons and holes for the Bi_2MoO_6/g - C_3N_4 composite was investigated by photoluminescence (PL) [4,25]. It is well known that the lower PL emission intensity indicates the lower recombination

efficiency of photogenerated charge carriers and thus the higher photocatalytic activity. Fig. 10 shows the PL spectra of the g-C₃N₄, Bi₂MoO₆ and 1:3 Bi₂MoO₆/g-C₃N₄ composites. Pure g-C₃N₄ exhibits the highest emission intensity, centering at about 459 nm, which is approximately equal to its optical band gap. It is important to note that the emission intensity of the 1:3 Bi₂MoO₆/g-C₃N₄ heterostructure is obviously lower than that of the pure g-C₃N₄ and Bi₂MoO₆ samples, indicating that the recombination rate of photogenerated charge carriers is truly lower in the Bi₂MoO₆/g-C₃N₄ composite. The PL results confirm the importance of the heterojunctions between Bi₂MoO₆ and g-C₃N₄ in hindering the recombination of electrons and holes.

In order to ascertain the active species in the degradation process and verify the supposed photocatalytic mechanism, some sacrificial agents, such as isopropyl alcohol (IPA), disodium ethylenediaminetetraacetate (EDTA) and 4-benzoquinone (BQ) were used as the hydroxyl radical (•OH) scavenger, hole (h⁺) scavenger and superoxide radical (•O₂⁻) scavenger [17,18]. As shown in Fig. 11, the photocatalytic degradation of RhB was slightly affected by the addition of 1 mM IPA (a quencher of •OH). However, when 1 mM of BQ is added, obvious decrease of degradation rate is observed, which indicated that the existence of $•O_2^-$ species. In addition, the degradation of RhB was also significantly depressed with the addition of 1 mM of EDTA, suggesting that the holes also play a crucial role in the process of RhB oxidation. The active species trapping experiments demonstrated that the $•O_2^-$ and h⁺ are the two main active species in the degradation process of RhB, which

contributed to the enhancement of photocatalytic activity of the $Bi_2MoO_6/g-C_3N_4$ composite.

According to the above results, the schematic band energy levels and charge transfer processes of the $Bi_2MoO_6/g-C_3N_4$ composites can be illustrated as Fig. 12. Coupling two or several semiconductors with matchable band structures has been widely considered as one of the most promising methods to construct a high-performance photocatalyst system. Many researchers attributed the synergetic effect to the efficient charge transfer at the interface of two semiconductors or multiple semiconductors, which would lead to an effective photoexcited electron-hole separation and promote the photocatalytic activity [27-29]. As revealed in Fig. 11, as the CB potential of $g-C_3N_4$ is more negative than that of Bi_2MoO_6 , the photogenerated electrons (e) in the CB of $g-C_3N_4$ are easier to move to the CB of Bi_2MoO_6 owing to the interfacial interactions between the two components. Then, the e⁻ further reacted with oxygen molecules absorbed in the surface of photocatalyst to generate superoxide radical ($\cdot O_2$). Meanwhile, the photoinduced holes (h⁺) in the VB of Bi₂MoO₆ will transfer to the VB of g-C₃N₄. Thus, the photogenerated electrons and holes were effectively separated in the Bi₂MoO₆/g-C₃N₄ heterojunction, which allowed the $\cdot O_2^-$ and h⁺ to play photooxidated roles in photocatalytic reactions.

4. Conclusions

Visible-light-driven heterostructured photocatalysts $Bi_2MoO_6/g-C_3N_4$ were successfully synthesized by a mixed-calcination method. The homogenous compositing of Bi_2MoO_6 nanosheets on $g-C_3N_4$ was confirmed by XRD, FTIR, SEM

and EDX mapping. The photodegradation and photoelectrochemical experiments revealed that the Bi_2MoO_6/g - C_3N_4 composite exhibits enhanced photocatalytic reactivity for RhB degradation and photocurrent response than the two individual components under visible light irradiation. EIS and PL results demonstrated that the high separation and fast transfer of photogenerated charge carriers resulted from the Bi_2MoO_6/g - C_3N_4 heterojunction fabrication are responsible for the high photocatalytic performance of Bi_2MoO_6/g - C_3N_4 . The detailed radicals trapping experiments revealed that superoxide radicals ($\bullet O_2^-$) and holes (h^+) play dominated roles in the photooxidation process.

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Figures caption

- Fig. 1 Crystal structures of g-C₃N₄ and Bi₂MoO₆.
- **Fig. 2** XRD pattern of g-C₃N₄, Bi₂MoO₆ and Bi₂MoO₆/g-C₃N₄ photocatalysts with molar ratios of 1:5, 1:3, 1:1 and 3:1.
- **Fig. 3** FTIR spectra of g-C₃N₄, Bi₂MoO₆ and Bi₂MoO₆/g-C₃N₄ with molar ratios of 1:5, 1:3, 1:1 and 3:1.
- Fig. 4 SEM images of the as-obtained samples: (a) g-C₃N₄, (b) Bi₂MoO₆, (c,d) 1:3 Bi₂MoO₆/g-C₃N₄.
- Fig. 5 (a) SEM image and (b-f) SEM-EDX mapping images.
- **Fig. 6** UV-vis diffuse reflectance spectra of g-C₃N₄, Bi₂MoO₆, Bi₂MoO₆/g-C₃N₄ photocatalysts with malar ratios of 1:5, 1:3, 1:1 and 3:1.
- Fig. 7 (a) Photocatalytic degradation curves of RhB over the as-prepared g-C₃N₄, Bi₂MoO₆ and Bi₂MoO₆/g-C₃N₄ samples under the irradiation of visible-light (λ > 420 nm). (b) UV-visible spectra of RhB at different visible irradiation time in the presence of 1:3 Bi₂MoO₆/g-C₃N₄.
- Fig. 8 Comparison of transient photocurrent responses of $g-C_3N_4$, Bi_2MoO_6 and 1:3 $Bi_2MoO_6/g-C_3N_4$ photocatalysts under visible light irradiation ($\lambda > 420$ nm, $[Na_2SO_4] = 0.1$ M).
- Fig. 9 EIS Nynquist plots of g-C₃N₄, Bi₂MoO₆ and 1:3 Bi₂MoO₆/g-C₃N₄ electrodes under the irradiation of visible light ($\lambda > 420$ nm, [Na₂SO₄] = 0.1 M).
- Fig. 10 Photoluminescence spectra of the $g-C_3N_4$, Bi_2MoO_6 and 1:3 $Bi_2MoO_6/g-C_3N_4$ composite.
- Fig. 11 Photocatalytic degradation of RhB over 1:3 Bi₂MoO₆/g-C₃N₄ photocatalyst

alone and with the addition of IPA, EDTA, or BQ.

Fig. 12 Schematic diagram of the possible mechanism over the 1:3 Bi_2MoO_6/g - C_3N_4

photocatalyst under visible light irradiation.



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10



Fig. 11



Fig. 12