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## تجزیه فوتوشیمیایی محلول‌های محتوی سولفانیلک اسید با استفاده از تابش مستقیم نور فرابنفش

pH  
pH  
ppm  
pH  
COD  
FT-IR

COD :

## **Photochemical Decomposition of Solutions Containing Sulfanilic Acid Using Direct UV Irradiation**

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### **Abstract**

This investigation is concerned with photochemical degradation of sulfanilic acid. This substance is largely used in textile and dye industries, a part of which is discharged in the wastewater. A jacketed circulating reactor, equipped with direct imposed irradiation has been designed and used in this work. The concentrations of substrate have been determined using an ultraviolet-visible spectrophotometer. The experimental data has been obtained for each run after adjustment of pH and temperature of operation. The irradiation time has also been controlled. There is an optimal  $\text{pH} \approx 4$  (close to substrate concentration of 10 ppm) for which the maximum conversion is obtained. A 30 min irradiation time, for example, was sufficient for complete removal of substrate with 10 ppm initial concentration. The significant decrease of COD and the significant removal of the carbon – carbon double bonds observed in the FT-IR spectrum indicate that the degradation is consistent with mineralizing of the organic substrate (conversion of benzene ring to carbon dioxide and water, conversion of sulfite group

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to sulfate and conversion of amine group to nitrate). The method of degradation of sulfanilic acid could therefore have useful industrial applications.

**Keywords:** Photochemical decomposition, Circulating reactor, Sulfanilic acid, COD

(AOPs)

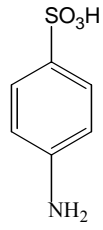
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O<sub>3</sub>/UV H<sub>2</sub>O<sub>2</sub>/UV

COD

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( )  $LD_{50}=12300 \text{ mg/kg}$

(circulating stream)

pH

(FT-IR)

( ) (Chemical Oxygen Demand, COD)

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l...

( ) (spouted reactor)

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(UV-A

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pH

pH

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( $\lambda_{\max} =$  nm) (UV-Vis)  
( )

( )  
ppm

-SO<sub>3</sub>H -NH<sub>2</sub>

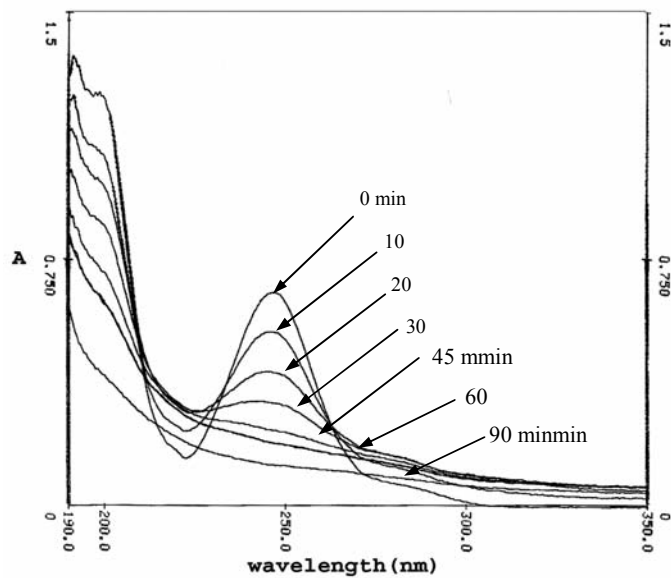
( ) nm

$\pi$

nm / nm

( )

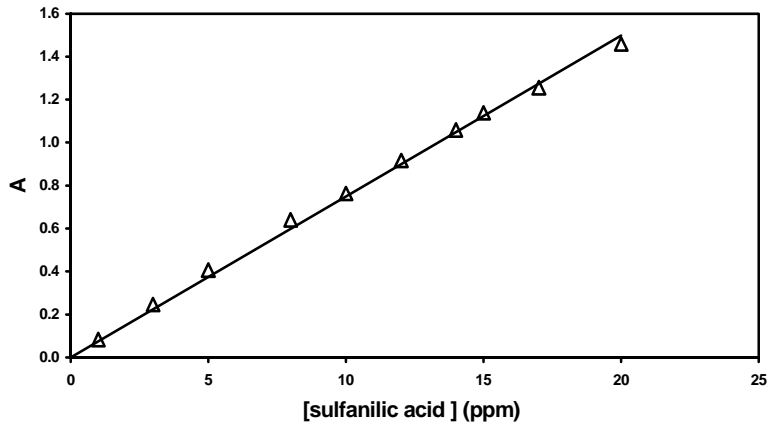
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nm  
( )

(ppm) c)  $A = \epsilon \cdot l \cdot c$

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( ) TiO<sub>2</sub>

( )

FeCl<sub>3</sub>

ppm

pH)

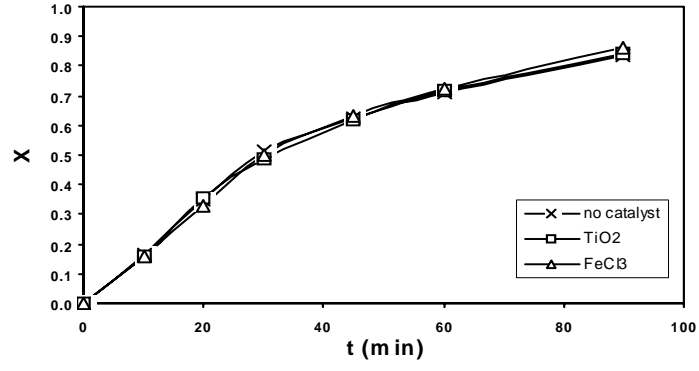
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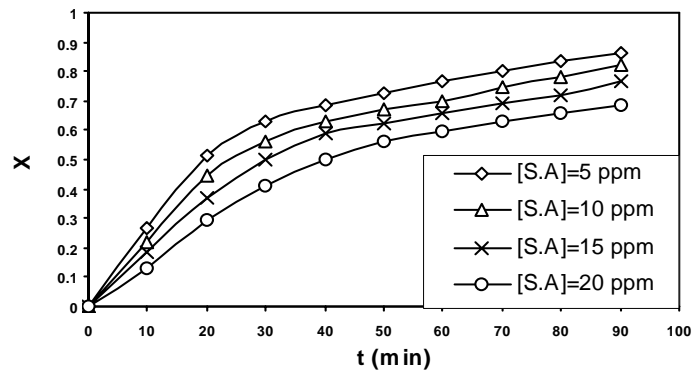


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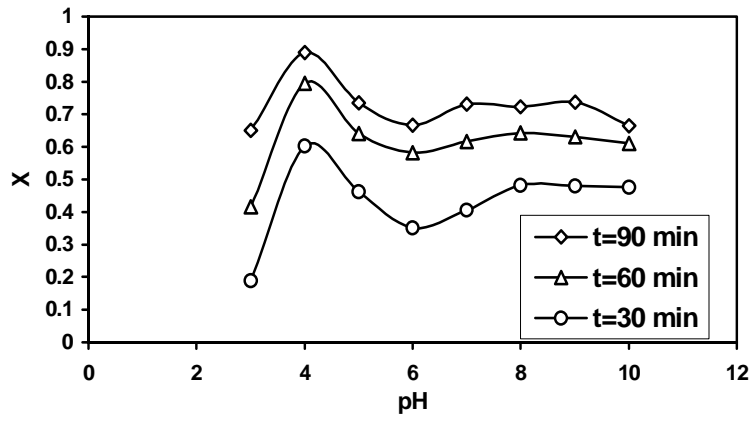
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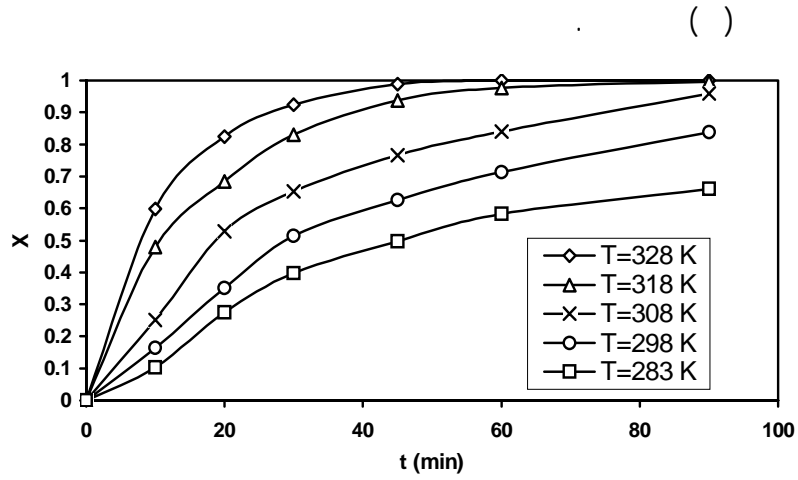


( $\Delta H <$ )

( $\Delta H >$ )

$^{\circ}\text{C}$

l...



:

FT-IR      COD

(COD)

(FT-IR)

°C      pH=      ,      ppm

COD

FT-IR

(      °C      )

( )

cm<sup>-1</sup>

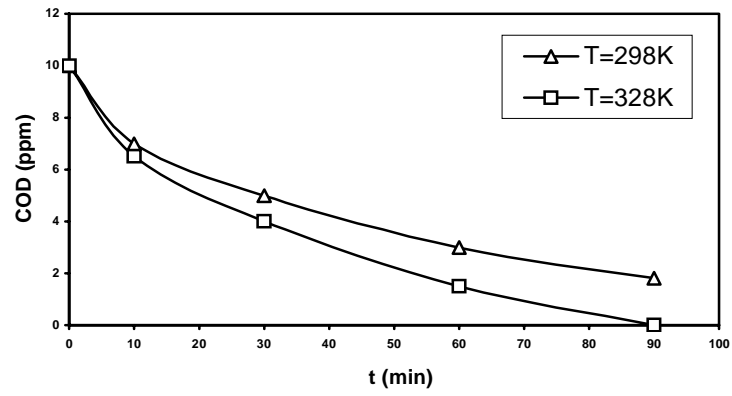
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$\text{cm}^{-1}$

( )

COD

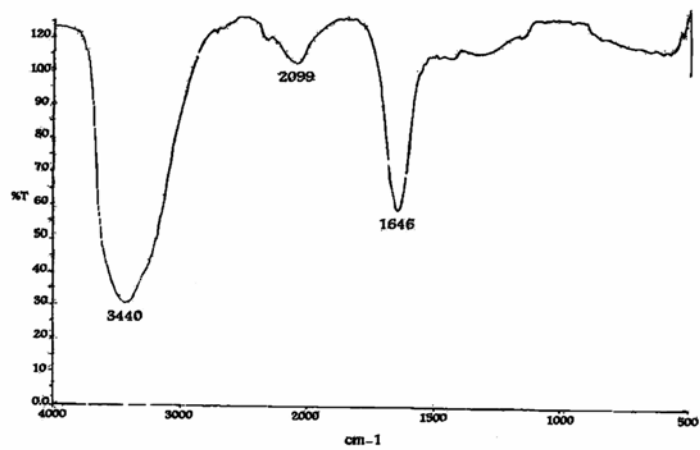
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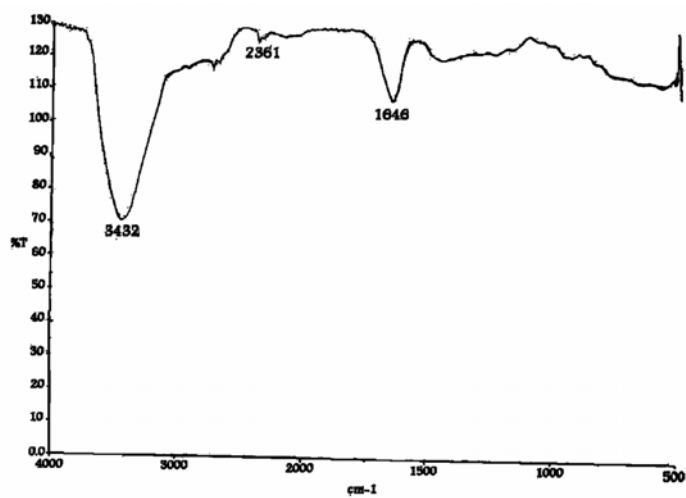
COD

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/...



FT-IR :



FT-IR :

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pH

pH

pH

ppm

FT-IR

/...

## UV/TiO<sub>2</sub>/H<sub>2</sub>O<sub>2</sub>

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