



TR 34009



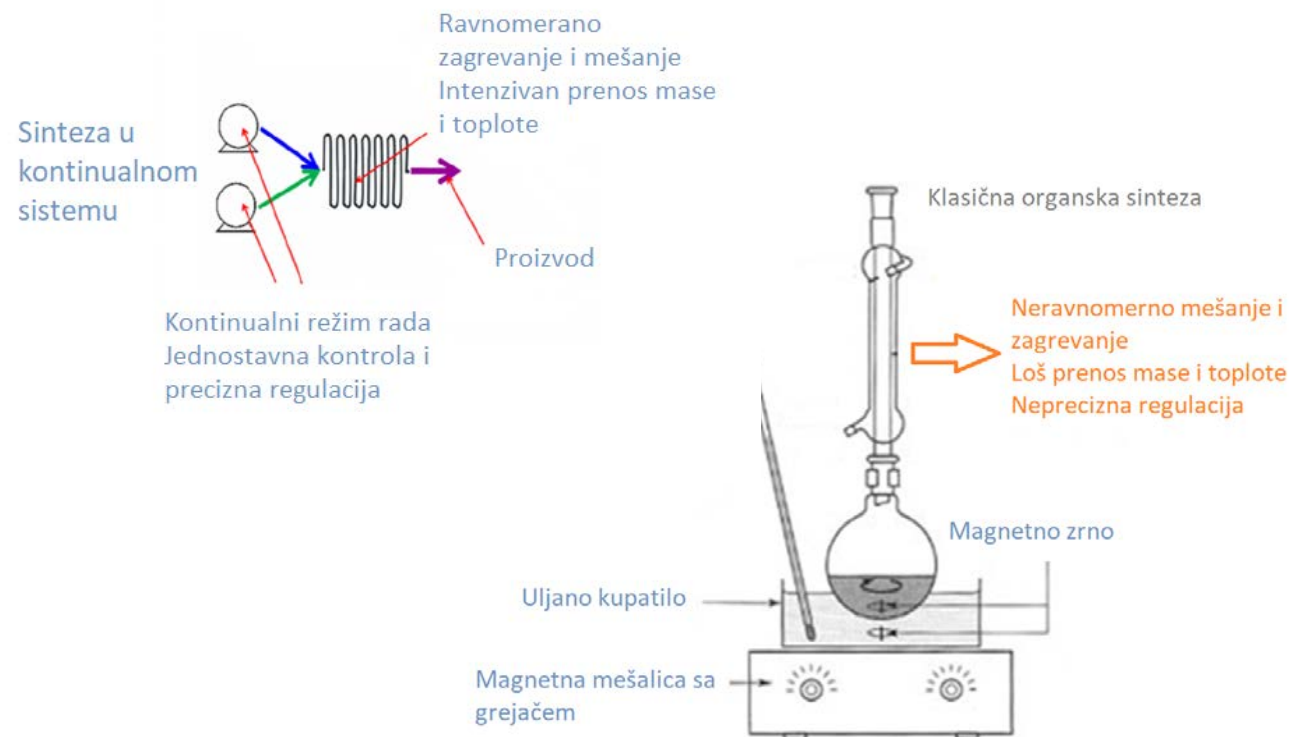
# Ispitivanje novog postupka sinteze *Schiff*-ove baze u mikroreaktorskom sistemu

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# Organska sinteza u kontinualnim sistemima

- Mikroreaktori
- Intenzivan prenos mase i toplote
- Visok stepen konverzije
- Precizna kontrola procesa
- Efikasnost
- *Eco-friendly*
- Jednostavan *scale-up*

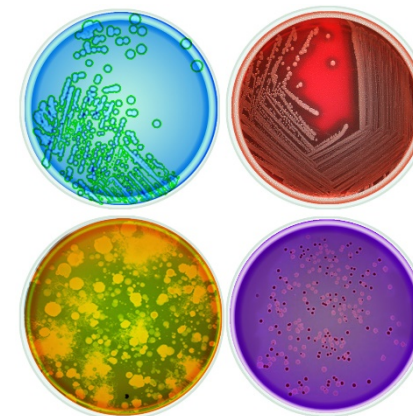




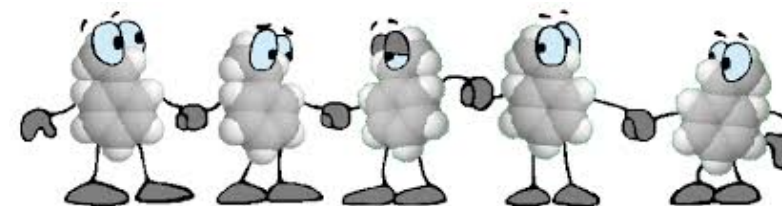
# Schiff-ove baze



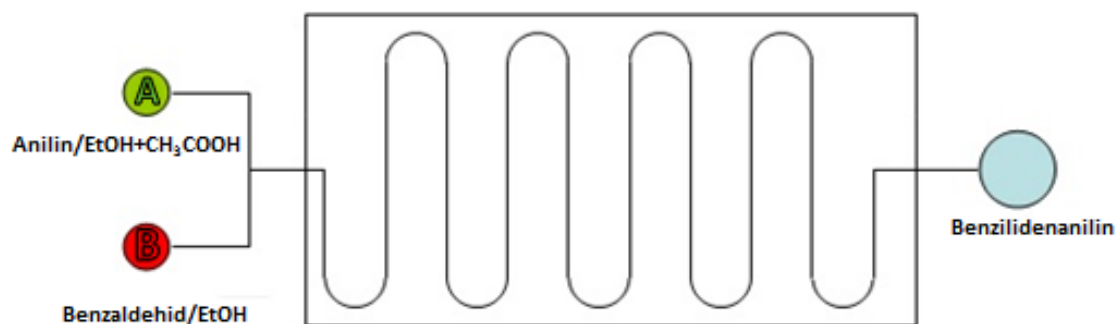
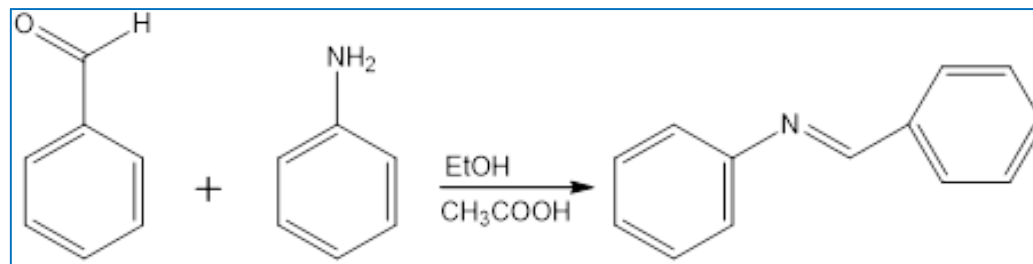
Schiff-ova baza (imin)



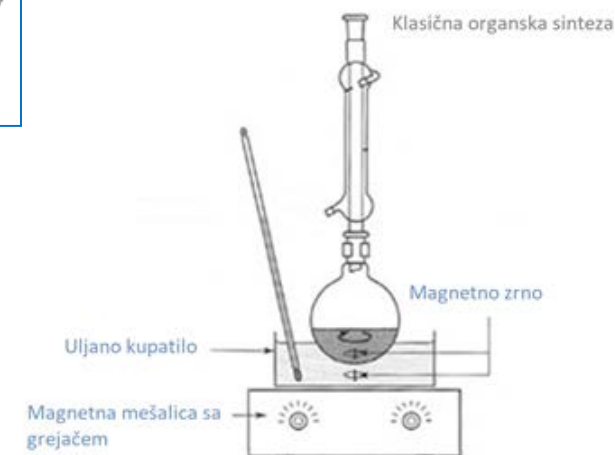
- Koriste se u industriji boja, katalizatora i polimera
- Grade metalne komplekse
- Katalitička i biološka aktivnost (antimikrobna, antiviralna, antiinflamatorna i antioksidativna svojstva)
- Primena u medicini i farmaciji



# Sinteza *Schiff*-ove baze



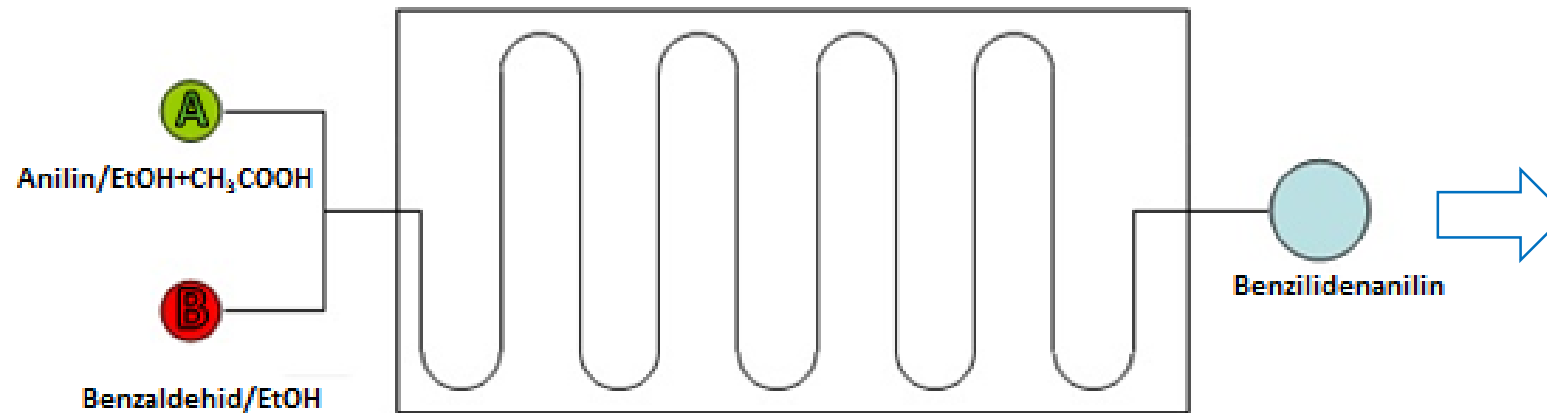
- Sobna temperatura
- Kratko vreme za dobijanje krajnjeg proizvoda
- Precizna regulacija procesa



- Zagrevanje (refluks)
- Dugo vreme trajanja reakcije
- Dodatan utrošak rastvarača za rekristalizaciju proizvoda

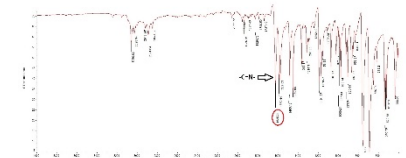
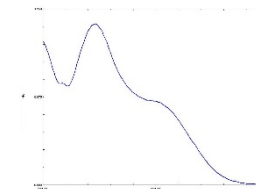
# Sinteza benzilidenanilina u kontinualnom sistemu

Dužina  
mikroreaktora:  
50 ft (~15 m)  
Unutrašnji  
prečnik: 0,5 mm

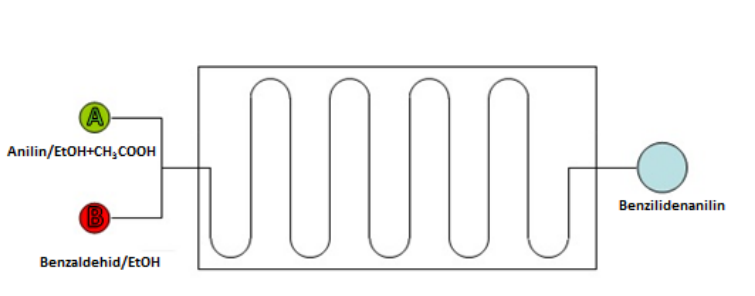


Inhibitor: 10%  
rastvor NaOH u  
EtOH  
Karakterizacija:  
T.t., FT-IR, UV-Vis

|           | c (A) mol·dm <sup>-3</sup> | c (B) mol·dm <sup>-3</sup> |
|-----------|----------------------------|----------------------------|
| Prvi set  | 0,2                        | 0,2                        |
| Drugi set | 1,0                        | 1,0                        |



# Rezultati prve serije eksperimenata

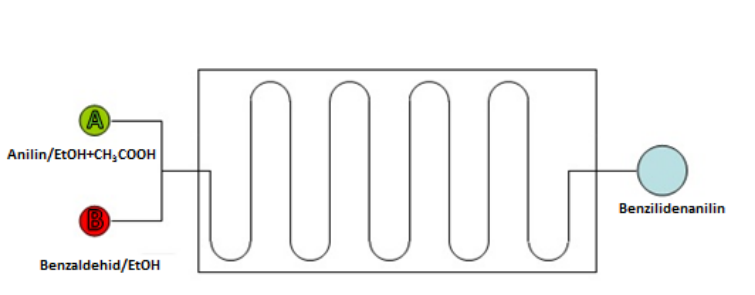


$$c(A)=0,2 \text{ mol}\cdot\text{dm}^{-3}$$

$$c(B)=0,2 \text{ mol}\cdot\text{dm}^{-3}$$

| R.b. eksperimenta | F (A) [cm <sup>3</sup> ·min <sup>-1</sup> ] | F (B) [cm <sup>3</sup> ·min <sup>-1</sup> ] | F <sub>T</sub> [cm <sup>3</sup> ·min <sup>-1</sup> ] | τ [min] | V [cm <sup>3</sup> ] | Y [%] |
|-------------------|---|---|--|---------|----------------------|-------|
| 1.                | 0,05  | 0,05  | 0,10   | 30      | 4,50                 | 40    |
| 2.                | 0,07  | 0,07  | 0,14   | 21      | 4,50                 | 45    |
| 3.                | 0,10  | 0,10  | 0,20   | 15      | 4,50                 | 60    |
| 4.                | 0,30  | 0,30  | 0,60   | 5       | 4,50                 | 45    |
| 5.                | 0,50  | 0,50  | 1,00   | 3       | 4,50                 | 40    |

# Rezultati druge serije eksperimenata

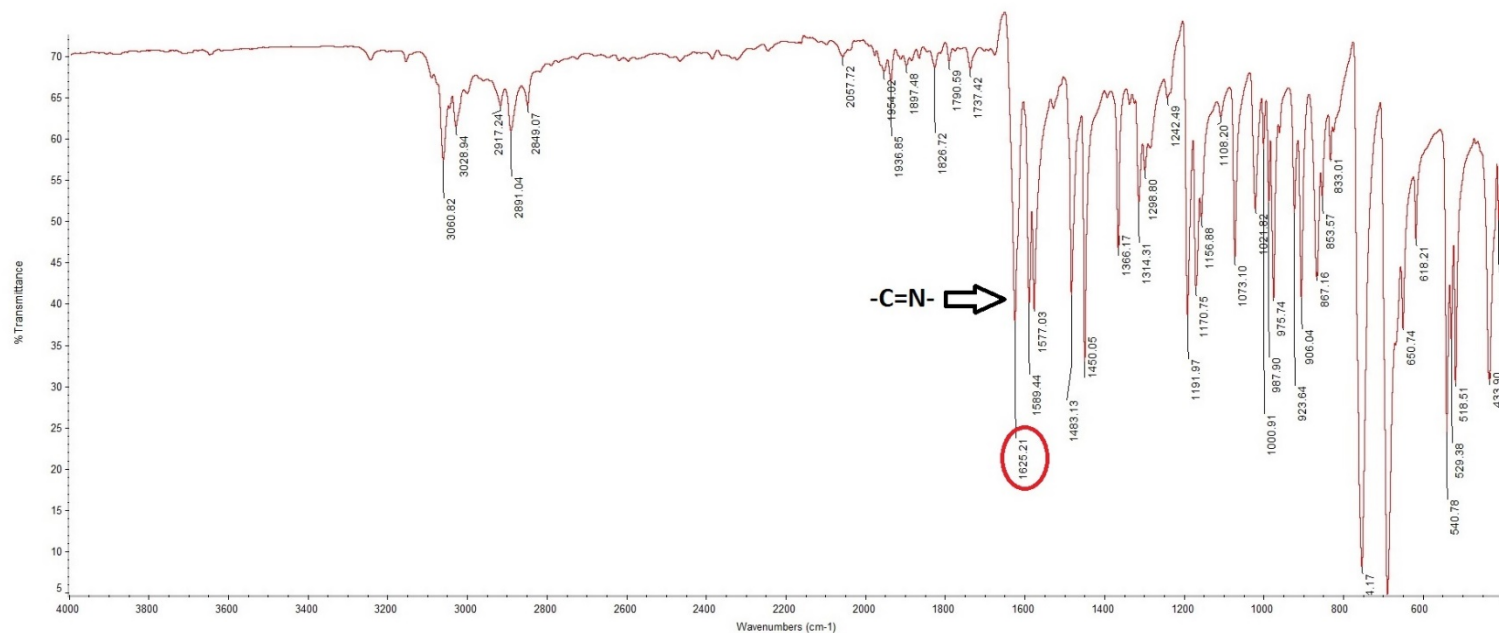
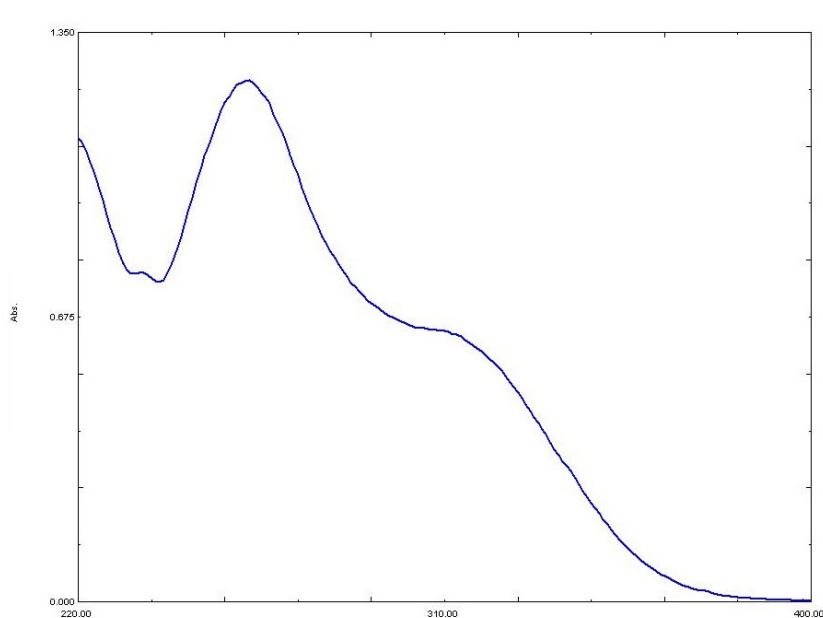


$$c(A)=1,0 \text{ mol}\cdot\text{dm}^{-3}$$

$$c(B)=1,0 \text{ mol}\cdot\text{dm}^{-3}$$

| R.b. eksperimenta | F (A) [cm <sup>3</sup> ·min <sup>-1</sup> ] | F (B) [cm <sup>3</sup> ·min <sup>-1</sup> ] | F <sub>T</sub> [cm <sup>3</sup> ·min <sup>-1</sup> ] | τ [min] | V [cm <sup>3</sup> ] | Y [%] |
|-------------------|---|---|--|---------|----------------------|-------|
| 1.                | 0,05  | 0,05  | 0,10   | 30      | 4,50                 | 60    |
| 2.                | 0,07  | 0,07  | 0,14   | 21      | 4,50                 | 55    |
| 3.                | 0,10  | 0,10  | 0,20   | 15      | 4,50                 | 55    |
| 4.                | 0,30  | 0,30  | 0,60   | 5       | 4,50                 | 60    |
| 5.                | 0,50  | 0,50  | 1,00   | 3       | 4,50                 | 85    |

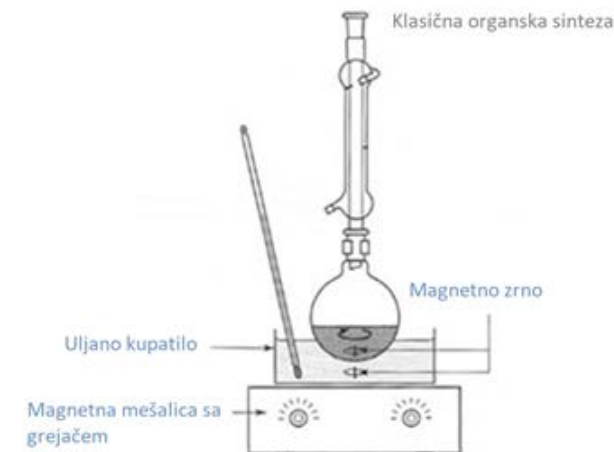
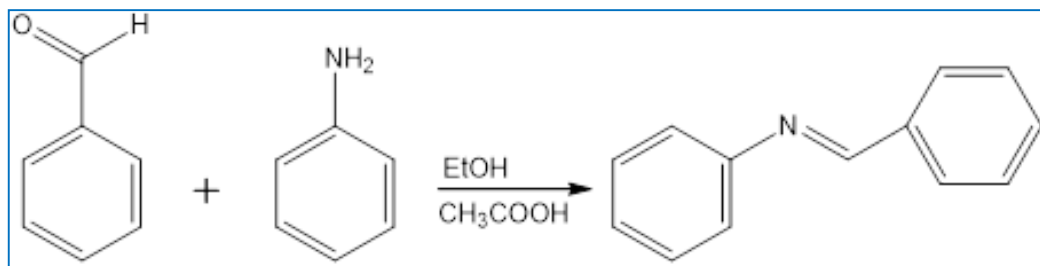
# Karakterizacija benzilidenanilina



$$\lambda_{\max} (\text{EtOH}, c=5 \cdot 10^{-5} \text{ mol} \cdot \text{dm}^{-3}) = 260 \text{ nm}$$



# Sinteza benzilidenanilina u šaržnom sistemu



| n (A) [mmol] | n (B) [mmol] | V (EtOH) [cm <sup>3</sup> ]<br>*5 kapi CH <sub>3</sub> COOH | t [min] | Y [%] |
|--------------|--------------|---|---------|-------|
| 30           | 30           | 25  | 120     | 80    |

# Zaključak

| Sinteza u kontinualnom sistemu | Klasična sinteza |
|--------------------------------|------------------|
| Prinos 85%                     | Prinos 80%       |
| 3 min                          | 120 min          |
| Sobna temperatura              | Refluks          |



# Hvala na pažnji!



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