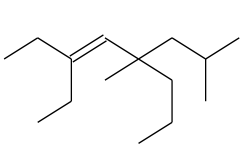
OLIMPIADA DE CHIMIE– etapa judeţeană
22 februarie 2014

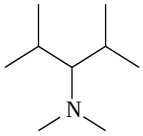
BAREM DE EVALUARE - Clasa a XI-a

Subiectul I .....**20 puncte**

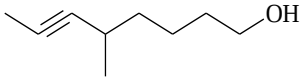
A. 1.



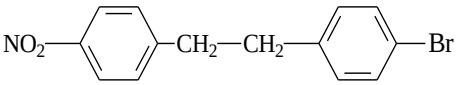
a)



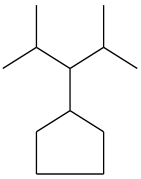
b)



c)



d)



e)

5 puncte

2. a) 2 stereoizomeri;b) 0 stereoizomeri; c) 4 stereoizomeri;

3 puncte

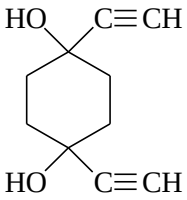
3. a) metanol - pk_{a4}= 16; fenol - pk_{a2}= 10; acid p-clorobenzoic - pk_{a1}= 3,99; acid-2nitrobenzoic- pk_{a3}= 2,17.
b) I > IV > II > III

4,5 puncte

B.

1) A: CH_3COOH B: $HCOOH$

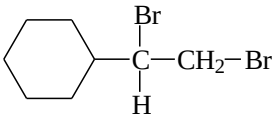
2) D:



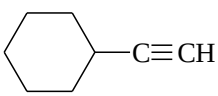
3) E: $CH_3-CH_2-C\equiv C-CH_2-CH_3$ F: $CH_3-CH_2-CH=CH-CH_2-CH_3$

G: $CH_3-CH_2-\underset{OH}{CH}-\underset{OH}{CH}-CH_2-CH_3$

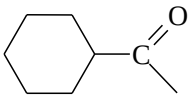
4) J:



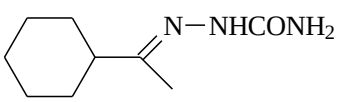
L:



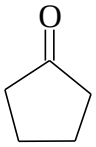
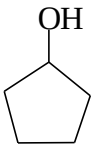
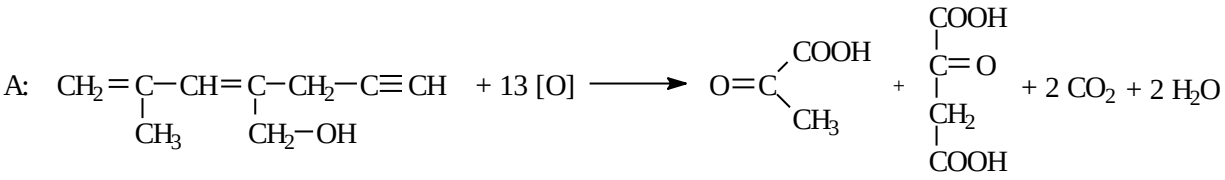
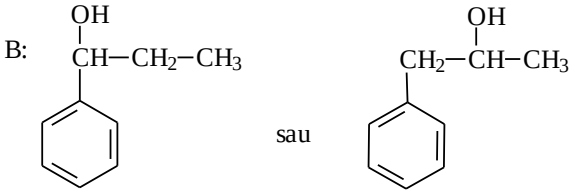
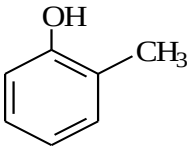
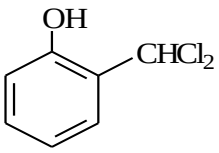
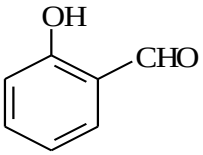
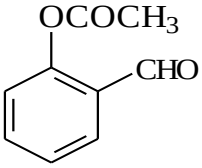
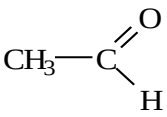
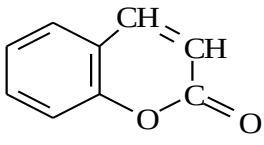
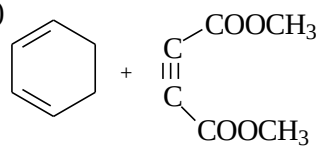
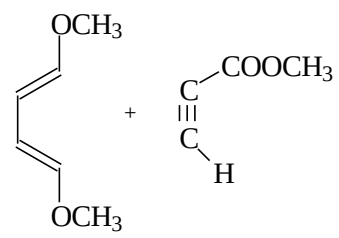
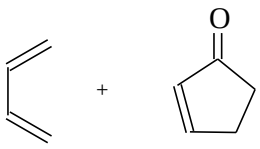
M:



N:

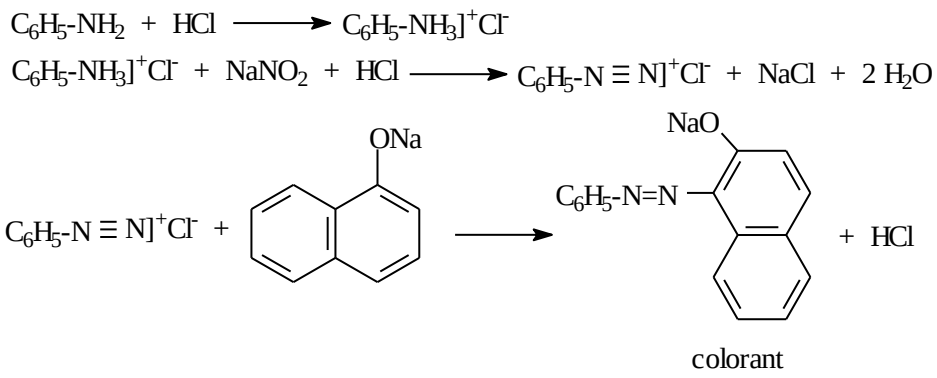


5 puncte

5) R:  T:  $1.O_3$ $2.\ H_2/NaBH_4/LiAlH_4$ $3.\ H^+$	2,5 puncte
Subiectul II ..... **25 puncte**	
A. N.E.=4;  A are 2 izomeri geometrici ; B are 2 izomeri optici ; Scrierea corectă a formulelor de structură pentru acid piruvic, acid oxosuccinic; Scriere corectă structură izomer B 	9 puncte
B. Scriere corectă structuri A: CH_4; B: $CH\equiv CH$; C: C_6H_6; D: C_6H_5-OH; E: CH_3-Cl F:  G:  H:  I:  J:  K: CH_3-COOH L: CH_3COCl 1,2 benzopironã: 	13 puncte
C. Identificare structuri diene şi filodiene a)  b)  c) 	3 puncte

Subiectul III ..... **25 puncte**

A. a)



colorant — 5 puncte

b) raport molar $C_6H_5\text{-}NH_2$: HCl =1:2; Vs_{HCl}=550 L; $n_{totalHCl}$= 2,2 kmoli; — 5 puncte

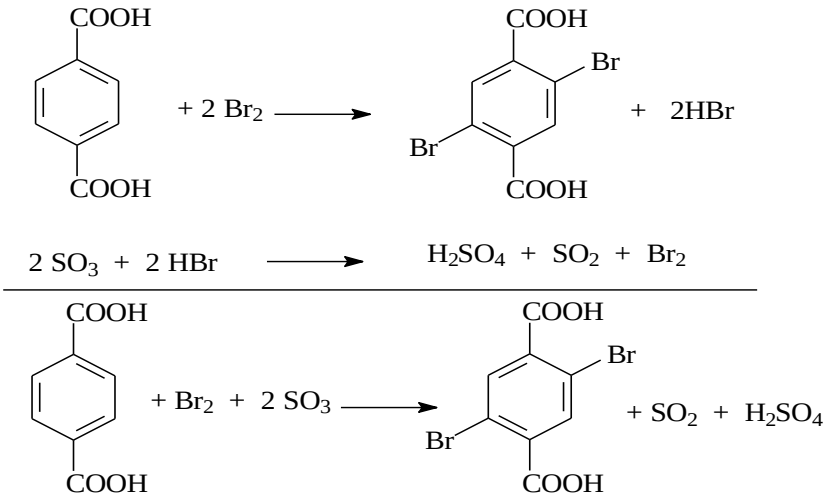
c) $M_{colorant}$=270 g/mol; $n_{colorant}$=0,66 kmoli; η= 66% — 2 puncte

B.a) $CxHy(COOH)_2 + 2Br_2 \rightarrow CxH_{y-2}Br_2(COOH)_2 + 2HBr$

M_A $M_A + 2x79$

$\frac{2 \cdot 79}{M_A} \cdot 100 = 95{,}18$; M_A=166 ; $M_A = M_{CxHy} + 90$; $M_{CxHy} = 76$; acid tereftalic; argumentare — 3 puncte

b) teoretic raport acid tereftalic : Br_2 =1:1;



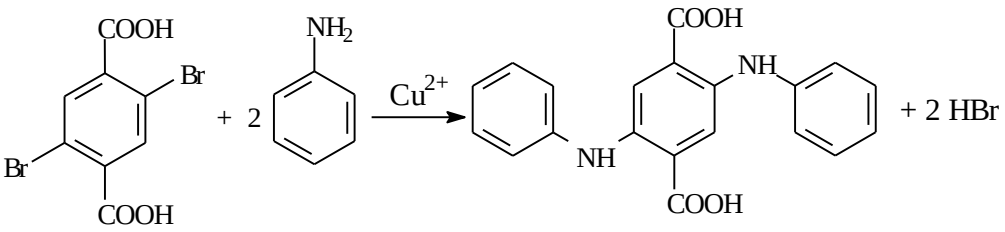
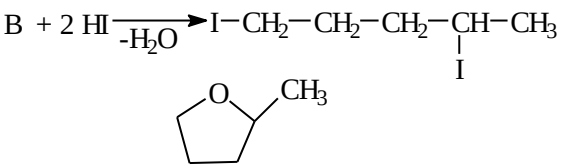
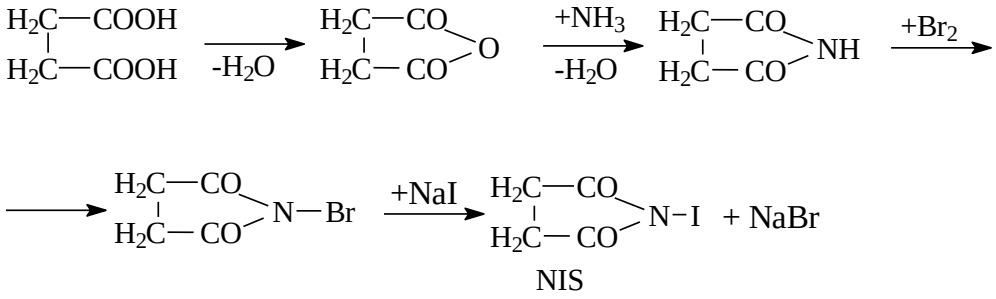
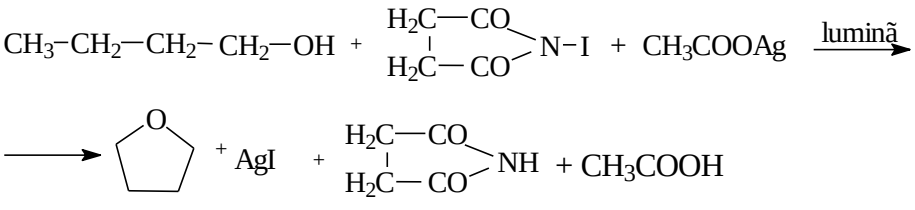
3 puncte

c) $M_{acidtereftalic}$= 166 g/mol ; $n_{acidtereftalic}$=0,2 moli

n_{HBr}= 0,4 moli; $n_{HBroxidat}$=0,36 moli;

$2SO_3 + 2HBr \rightarrow H_2SO_4 + SO_2 + Br_2$

$n_{SO3oxidare}$=0,36 moli; necesarul real este: n_{SO3} = 0,45 moli; md_{SO3}=36 g; c = 12 % — 4 puncte

d) identificare D 	3 puncte
Subiectul IV..... **30 puncte**	
A. a) $[\alpha]=\frac{100\times\alpha}{l\times c}$; $[\alpha]=-13,5^0$	7 puncte
b) raport izomer levogir:dextrogir = 7:3	3 puncte
B. a) $M_{(CH3\text{-}COOAg)}$=167 g/mol; M_A= 88 g/mol; Identificare A= $C_5H_{11}OH$, structură A = CH_3-$(CH_2)_4$-OH	4 puncte
b) identificare structură B = 2-metil-tetrahidrofuran; scriere ecuație B cu HI 	3 puncte
c) 4 ecuații x 2p 	8 puncte
d) ecuația reacției;  M($C_4H_{10}O$) = 74 g/mol; M(C_4H_8O) =72 g/mol; m(C_4H_8O) = 81 g	5 puncte

Barem elaborat de LaviniaMureşan, profesor la Colegiul Naţional Alexandru Papiu Ilarian din TârguMureş

<u>Notă:</u> Orice variantă corectă de rezolvare se va lua în considerare.