# What is the atom economy of this reaction?





Atom economy = (MW  $_{desired product}$  /  $\Sigma$  MW  $_{reagents}$ ) x 100%

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#### **Reaction 2. Pyridinium tribromide**



Atom economy = (MW <sub>desired product</sub> / 
$$\Sigma$$
 MW <sub>reagents</sub>) x 100%

## What is the atom economy of this reaction?



Atom economy = (MW <sub>desired product</sub> /  $\Sigma$  MW <sub>reagents</sub>) x 100%

### What is the effective mass yield of this reaction?

**Reaction 1. Traditional Bromination** 



Formula					
Name	Weight	eq	mmol	wt / vol	
trans-stilbene	180.25	1.00	10.0	1.80 g	
bromine	159.81	1.05	10.5	1.68 g	

Assume 90% yield

Effective mass yield = (mass desired product /  $\Sigma$  mass reagents) x 100%

## What is the effective mass yield of this reaction?

**Reaction 2.** Pyridinium tribromide



 $C_{14}H_{12} = 180.25$ 

 $C_5H_6NBr_3 = 319.82$ 

diphenylethane  $C_{14}H_{12}Br_2 = 340.05$ 

 $C_5H_6NBr = 160.01$ 

Formula					
Name	Weight	eq	mmol	wt / vol	
trans-stilbene	180.25	1.00	10.0	1.80 g	
pyridinium tribromide (90%)	319.82	1.13	11.3	3.61 g	

Assume 90% yield

Effective mass yield = (mass desired product /  $\Sigma$  mass reagents) x 100%

## What is the effective mass yield of this reaction?



	Formula				
Name	Weight	density	eq	mmol	wt / vol
trans-stilbene	180.25		1.00	10.0	1.80 g
hydrobromic acid 48%	80.92	1.49	2.80	28.0	3.18 mL
hydrogen peroxide 30%	34.02	1.11	2.06	20.6	2.12 mL

Assume 90% yield

Effective mass yield = (mass desired product /  $\Sigma$  mass reagents) x 100%

#### What is the solvent?

#### **Reaction 1. Traditional Bromination**



Formula					
Name	Weight	eq	mmol	wt / vol	
trans-stilbene	180.25	1.00	10.0	1.80 g	
bromine	159.81	1.05	10.5	1.68 g	

Is  $CH_2CI_2$  benign?

What is the mass of  $CH_2CI_2$ ?

Assume that the concentration of stilbene in  $CH_2CI_2$  is 0.25 M Assume 90% yield

Effective mass yield = (mass desired product /  $\Sigma$  mass reagents & non-benign solvent) x 100%