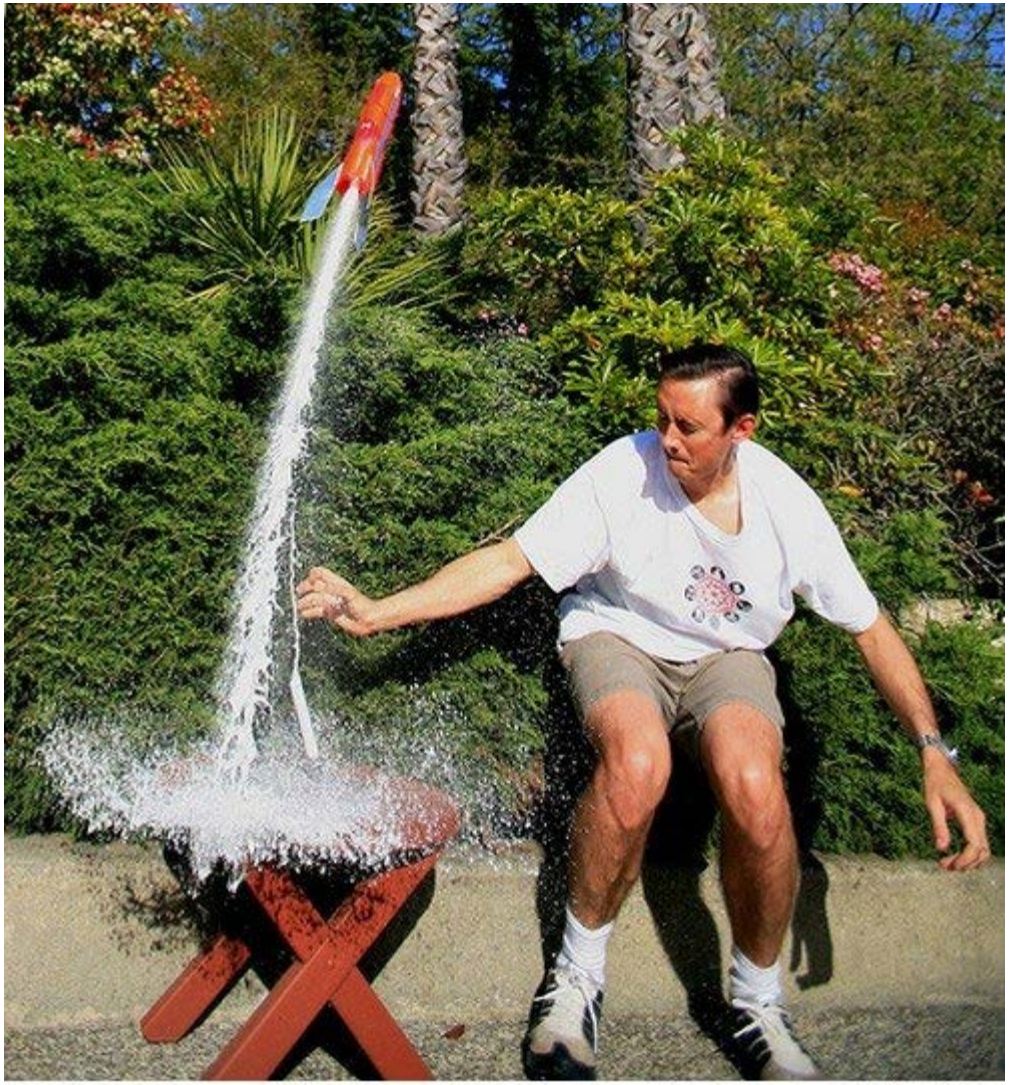
$CH_3COOH + NaHCO_3 = CH_3COONa + CO_2 + H_2O$



Mix together 30 grams of acetic acid and 60 grams of $NaHCO_3$. Determine the mass of each product.

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Step 1. Determine the number of moles of each reagent.

$$n_{CH_3COOH} = \frac{30\ g}{60\ g/mol} = 0.5\ moles$$

$$n_{NaHCO_3} = \frac{60\ g}{84\ g/mol} = 0.714\ moles$$

Mix together 30 grams of acetic acid and 60 grams of $NaHCO_3$. Determine the mass of each product.

Step 2. Make a reaction table

	CH_3COOH	$NaHCO_3$	CH_3COONa	CO_2	H_2O
Initial	0.5	0.714	0.0	0.0	0.0
Change	-0.5	-0.5	0.5	0.5	0.5
Final	0.0	0.214	0.5	0.5	0.5

Further question:

Mix together 30 grams of acetic acid and 60 grams of $NaHCO_3$. Determine the volume of CO_2 produced.

Solution: From the reaction table

	CH_3COOH	$NaHCO_3$	CH_3COONa	CO_2	H_2O
Initial	0.5	0.714	0.0	0.0	0.0
Change	-0.5	-0.5	0.5	0.5	0.5
Final	0.0	0.214	0.5	0.5	0.5

Calculate the volume of CO_2 using the ideal gas law.

$$V_{co2} = \frac{nRT}{P} = \frac{(0.5\ mol)\left(0.08206\ \frac{Latm}{molK}\right)(298K)}{1\ atm}$$

The volume is 12.2 liters.

Have fun!