HCl solution for acid wash

Lab glassware should be washed in a 1% HCl solution (although some people use a 4% solution). You have a 37% HCl solution on hand. How would you prepare 1 liter of the 1% HCl solution?

To prepare a 1% HCl solution from a 37% HCl solution, you can use the dilution formula:

$C_1V_1 = C_2V_2$

where:

- C_1 is the concentration of the stock solution (37% HCl).
- V_1 is the volume of the stock solution needed.
- C_2 is the concentration of the desired solution (1% HCl).
- V_2 is the final volume of the desired solution (1 liter or 1000 mL).

First, convert the percentages to fractions:

- $37\% = 0.37$
- $1\% = 0.01$

Using the formula: $0.37V_1 = 0.01 \times 1000\,\text{mL}$

Solving for V_1:

$V_1 = \frac{0.01 \times 1000\,\text{mL}}{0.37}$

$V_1 \approx 27.03\,\text{mL}$

So, you need to add approximately 27.03 mL of the 37% HCl solution to distilled water to make a total volume of 1 liter of 1% HCl solution. Here are the steps:

1. Measure out 27.03 mL of the 37% HCl solution.
2. Add this 27.03 mL of 37% HCl to a container.
3. Add distilled water to the container until the total volume reaches 1 liter (1000 mL).

Remember to always add acid to water, not water to acid, to ensure safety and prevent exothermic reactions that can cause splashing.