

Re: molarity

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> So if, in a solution, we have 3 M Na⁺ and 1 M CO₃⁻ is the molarity of this
> solution:
>
> 2 M: 1 M Na₂CO₃ + 1 M Na⁺ that is left = 2M
> or
> 1 M: because Na₂CO₃ is the only thing I should considered

Neither, really. You seem to have an idea that "molarity" is a property that can be applied to a solution as a whole. If you had a complicated mixture of many solutes, like, say, seawater or blood, you would rarely say "this is a 2.0 M solution", as if that encompassed everything. There are times when it is useful to know the total concentration of every blessed thing in solution. Most often, we speak of the concentration of a specific component.

In your example, it is best to say it has 3 M Na⁺, 1 M carbonate (and 1 M of some undisclosed anion(s) to balance the extra sodium cations, assumed charge -1 for simplicity). You may also describe it as 1 M Na₂CO₃ and 1 M NaX (where X is whatever your undisclosed anion is). If it were important to know the total of everything, you might say, this solution has 5 M of total ions (3 M Na⁺, 1 M carbonate, 1 M X⁻). Sometimes people care about ionic strength, which is just a slightly different way of doing the accounting (sum up concentration times charge squared for each solute).

In any event, it is never correct to say, without some context, "this is a 2 M solution". You must always specify 2M of *what*. It may be a specific solute or ion. If you want/need to report the total of everything, say 2 M of total ions or whatever. You might have a conversation like, "How strong is that HCl?" "It is 2 M." In this case, it is clear from context that the solution is 2 M HCl (i.e. 2 M H⁺ and 2 M Cl⁻). Most of the time, we don't care about the total of all ions/solutes and are just interested in the concentrations of specific components.

I hope this makes sense.

- Craig

- *Follow-Ups:*

- ◆ *Re: molarity*

- ◇ *From:* Borek

- *References:*

- ◆ *molarity*

- ◇ *From:* John Doe III

- ◆ *Re: molarity*

- ◇ *From:* Dr_Dickie