

PRELAB:

1. Malic acid is a diprotic acid containing 2 carboxylate groups. Draw the structures of malic acid.
2. What other analytical methods might be used for quantitative analysis of malic acid in fruit juices?
3. What properties would you consider in choosing a reference standard for quantitative analysis by NMR?
4. How will changing pH affect the chemical shifts of malic acid? What potential problems might arise from these pH effects?

Follow the instructions provided in the [Virtual Lab](#) to help answer questions 5 and 6.

5. What acquisition parameters are important for a quantitative NMR measurement? How do you select the values of these parameters?
6. What data processing considerations are important for obtaining accurate and precise results?