

# Baffled by the Baby Bottle: A Case Study in Chemistry

by  
Michael A. Jeannot  
Department of Chemistry  
St. Cloud State University



“Wow, I can’t believe baby Maggie is already two weeks old!” exclaimed Bob.

“I know; I’m so glad you could get time off work to come here to the doctor for her checkup,” replied Bob’s wife, Julia. “How are things going at BB Plastics?”

Bob’s answer was interrupted by Maggie as she started to fuss in the waiting room. Bob promptly got out the bottle of formula and started feeding Maggie.

“Bob, what are these bottles made from?” Julia inquired. Julia had recently read an article in a magazine which discussed possible health problems for babies fed with plastic bottles.

“They’re made from polycarbonate,” replied Bob. “In fact, we make this stuff at BB Plastics. It is very impact resistant, transparent, and has been used for years in the food industry.”

“Yeah, polycarbonate, that’s the type of material I read about in the article. I’m concerned, Bob; maybe we shouldn’t be using these types of bottles?”

“But the Food and Drug Administration and other organizations have stood by polycarbonate for years. Why all the concern now?” retorted Bob.

“Well, I read that the polycarbonate bottles can produce some compound that disrupts the endocrine system—I think it was called bisphenol-A. I don’t think the levels were very high, but should we take the chance?”

Once again, Bob was interrupted, this time by Dr. Bill who was now ready to see Maggie. At the completion of the exam, Dr. Bill asked if there were any other concerns.

“Nope,” replied Bob.

Julia looked unsure. “Well, I do have one concern ... .”

## Questions

1. What is polycarbonate?
2. What is bisphenol-A?
3. How is polycarbonate made?
4. How could bisphenol-A come out of a polycarbonate bottle?
5. Do temperature and the type of material in the bottle (milk/juice, etc.) have anything to do with it?
6. What are some of the health risks of bisphenol-A?
7. What are some of the advantages and disadvantages of polycarbonate baby bottles?
8. What is meant by the term “lowest observed adverse effect limit (LOAEL)”?

9. What is meant by the term “reference” or “safe” dose?
10. What does the unit ppb mean?
11. What is meant by the term “detection limit”?
12. What concentration of bisphenol-A was found (a) in the magazine article, and (b) by other researchers?
13. How do we know if this is safe or not?

*Disclaimer:* The story presented in this case study and the characters in it are fictitious. The case itself is based on data reported in the literature—data that are available for public scrutiny and comment. There is no intent to “find fault” or present an opinion pro or con. Judgement is in the domain of the scientific community. Every effort has been made to present the scientific considerations concisely and accurately. Any errors should be attributed to the author Michael Jeannot and not the original investigators.

Case copyright held by the [National Center for Case Study Teaching in Science](#), University at Buffalo, State University of New York. Originally published September 3, 1999. Please see our [usage guidelines](#), which outline our policy concerning permissible reproduction of this work. Image in title block © nuiiun - Fotolia.com, ID#67362505.