Which substance acts as a female hormone and has been banned in baby bottles in Canada, but is still used as a plasticizer in everyday-use plastic bottles?

A. Estrogen
B. Di(2-ethylhexyl) phthalate
**C. Bisphenol A**
D. Glycol Methacrylate

The chemical 2,2-bis(4-hydroxyphenyl) propane, more commonly known as Bisphenol A (BPA), is a chemical monomer used primarily in the production of polycarbonate plastic and epoxy resins. Polycarbonate is used in food contact materials such as beverage bottles, infant feeding bottles, food containers, processing equipment and other articles. Epoxy resins are used in protective linings for a variety of canned foods and beverages, including infant formula.

Bisphenol A is an example of oestrogenic endocrine-disrupting chemicals (EEDCs) that can interfere with mammalian development by mimicking the action of the sex hormone oestradiol. For instance, the exposure of developing rodents to high doses of EEDCs advances puberty and alters their reproductive function. Low environmental doses of EEDCs may also affect development in humans. Effects have become apparent in humans over the past half century that are consistent with those seen in animals after exposure to high doses of EEDCs, such as an increase in genital abnormality in boys and earlier sexual maturation in girls. Exposing female mouse fetuses to an EEDC at a dose that is within the range typical of the environmental exposure of humans can alter the postnatal growth rate and brings on early puberty in these mice.

However, European Food Safety Authority's (EFSA) latest comprehensive re-evaluation of BPA exposure and toxicity was published in January 2015. EFSA's scientific experts concluded that BPA poses no health risk to consumers of any age group (including unborn children, infants and adolescents). Exposure from the diet or from a combination of sources (diet, dust, cosmetics and thermal paper) is considerably under the safe level ("tolerable daily intake" or TDI) of BPA in food: 4 micrograms per kilogram of body weight per day (µg/kg of bw/day). The highest estimates for dietary exposure and for exposure from a combination of sources (called "aggregated exposure") are 3 to 5 times lower than the tolerable daily intake (TDI). The TDI is an estimate of the amount of a substance (expressed on a body weight basis) that can be ingested daily over a lifetime without appreciable risk.

The use of BPA in the production of bottles for infants, however, remains illegal in Canada and some European countries.

References:

https://www.efsa.europa.eu/sites/default/files/corporate_publications/files/factsheetbpa150121.pdf

http://www.hc-sc.gc.ca/fn-an/securit/packag-emball/bpa/index-eng.php

Howdeshell, Kembra L., et al. "Environmental toxins: exposure to bisphenol A advances puberty." *Nature* 401.6755 (1999): 763-764.