

# Phthalate esters and reproductive toxicity

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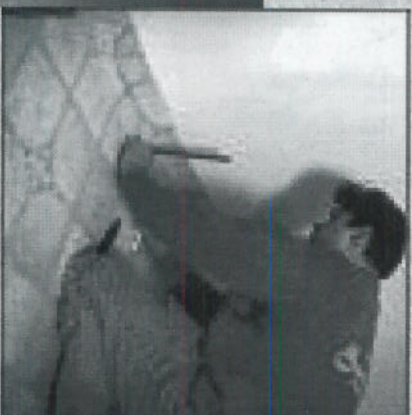
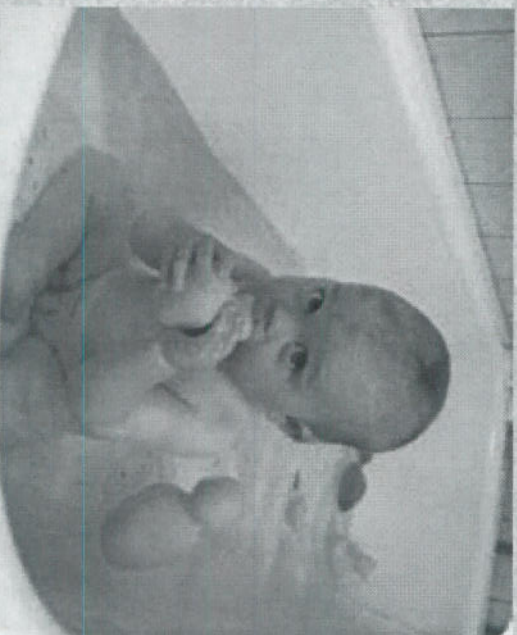
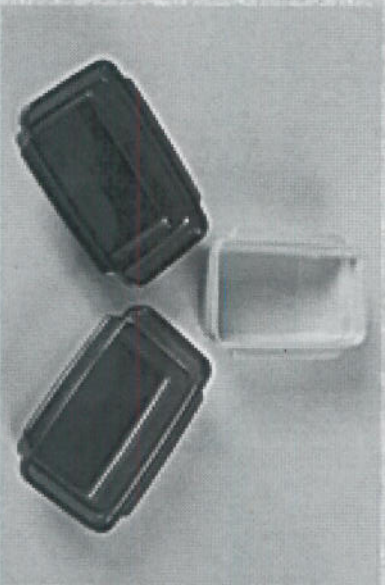
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# Uses of Phthalates





## ***What are phthalates and what are they used for?***

Used extensively as a plasticizers and solvents.

It is currently not possible to tell how much phthalate a product contains, if any, or what phthalate it contains(ed)

- Toys
- Modeling clay
- Light sticks
- Pharmaceuticals
- Personal care products
- Baby lotions
- Cosmetics
- Air fresheners
- Container linings
- PVC pipes
- Floor tiles
- More

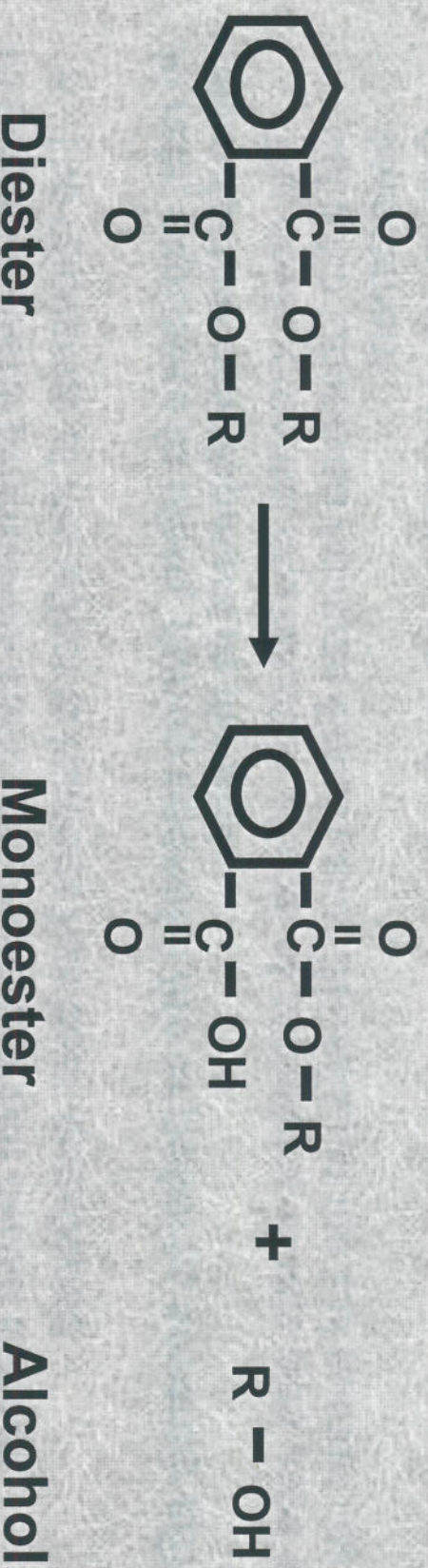


# Phthalate Esters - Background

- Some are weak ER agonists *in vitro* in some systems. No *in vivo* estrogenic activity.
- Generally not teratogenic in classical gd 6-15 studies in rats at levels <1g/kg/d. When developmental toxicity noted, always accompanied by maternal toxicity.
- Extensive metabolism occurs in the gut of rodents to form monoesters which are absorbed and believed responsible for reproductive and developmental toxicity.



# Metabolism of Phthalate Esters



**ω and ω-1 metabolites  
and glucuronides**



# Are phthalates toxic?

- *Most Phthalates have low acute toxicity (very high LD 50s)*
- *Most Phthalates are not teratogenic except at dose levels at or near those affecting the mother*
- *In rodents, some phthalates affect the liver and can cause cancer.*
  - The relevance of this effect to humans has been questioned
- *In rats, exposure in utero, during neonatal life or puberty, severely affects reproductive development in the male.*
  - The developmental reproductive effects of phthalates in rats was used to set a No Observed Adverse Effect Level (NOAEL) in the EU human risk assessment.
  - Critical effect NOAEL = 4.8 mg/kg/d
  - Known as the *Phthalate Syndrome* in rats
- *In female rats, phthalates also cause pregnancy loss, fetal death and reproductive tract malformations in female offspring*