

## Product Data Sheet

Product Name: Diisohexyl phthalate

Cat. No.: GC64744

### Chemical Properties

Cas. No. 71850-09-4

Formula C<sub>20</sub>H<sub>30</sub>O<sub>4</sub>

M.Wt 334.45

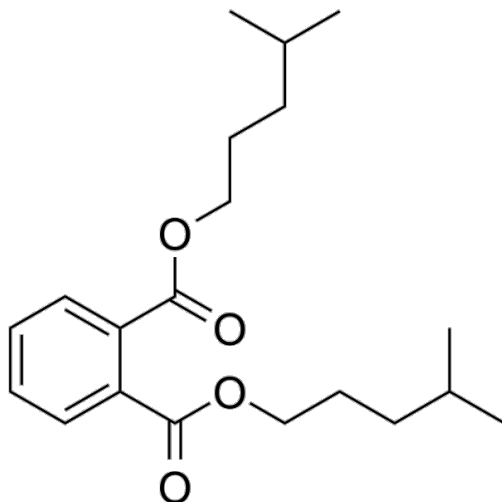
Solubility DMSO : 200 mg/mL (598.00 mM;  
Need ultrasonic)

Storage 4°C, protect from light

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



### Protocol

#### Cell experiment [1]:

Cell lines MCF-7

**Caution: Product has not been fully validated for medical applications. For research use only.**

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**Preparation Method** Transiently transfected MCF-7 cells [Gal4-HEGO, 17m5-G-Luc] were exposed to final concentrations of: (i) 0.1, 1, and 10 $\mu$ M for Diisohexyl phthalate, (ii) 1pM to 10nM for E2; or (iii) DMSO (solvent) alone. Following incubation with sample for 24h, cells were harvested and assayed for luciferase activity.

**Reaction Conditions** 0.1, 1, 10 $\mu$ M; 24h

**Applications** Diisohexyl phthalate did not induce a significant luciferase activity in MCF-7 cells at the concentrations tested (0.1 to 10 $\mu$ M), which indicated that Diisohexyl phthalate did not exhibit significant estrogen receptor-mediated activity.

### Animal experiment [1]:

**Animal models** OVX rats

**Preparation Method** Diisohexyl phthalate was administered orally at doses of 20, 200, and 2000mg/kg. The treatment period was 4 consecutive days via oral gavage, with the animals euthanized 24h after the last treatment on Day 5.

**Dosage form** 20, 200, and 2000mg/kg; oral administration; daily for 4 consecutive days

**Applications** Diisohexyl phthalate significantly increased uterine wet weight in Experiment 1, but significantly decreased uterine wet weight in Experiment 2, which indicated the effects on uterine wet weight were not reproducible across experiments. Diisohexyl phthalate did not induce significant vaginal epithelial cell cornification at any of the tested doses in mature OVX rats.

### References:

[1] Zacharewski T.R., Meek M.D., Clemons J.H., et al. Examination of the in Vitro and in Vivo Estrogenic Activities of Eight Commercial Phthalate Esters Toxicological Sciences. 1998; 46, 282–293

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### Background

Diisohexyl phthalate is a type of dialkyl phthalate showing agonistic activity via estrogen receptor  $\alpha$  (ER $\alpha$ ) with a REC<sub>20</sub> value of  $2.8 \times 10^{-6}$ M and antagonistic activity via estrogen receptor  $\beta$  (ER $\beta$ ) with an RIC<sub>20</sub> value of  $3.2 \times 10^{-6}$ M<sup>[1]</sup>. Diisohexyl phthalate is primarily used as a plasticizer, particularly in the production of plastics such as PVC<sup>[2]</sup>.

In vitro, Diisohexyl phthalate ( $10^{-7}$ - $10^{-5}$ M) treated CHO-K1 for 24h induced ER $\alpha$ -mediated transcriptional activity, but simultaneously inhibited ER $\beta$ - and human androgen receptor (AR)-mediated transcriptional activities<sup>[1]</sup>. Diisohexyl phthalate (0.1, 1, 10 $\mu$ M) exposure for 24h did not induce significant luciferase activity in MCF-7 cells transiently transfected with the Gal4-human estrogen receptor chimera (Gal4-HEGO) and the Gal4-regulated luciferase reporter gene (17m5-G-Luc). This result indicated that Diisohexyl phthalate did not exhibit significant estrogen receptor-mediated activity in this cell assay<sup>[3]</sup>.

In vivo, Diisohexyl phthalate (20, 200, and 2000mg/kg) administered orally daily for 4 consecutive days in OVX rats didn't exert reproducible effect on uterine wet weight or induce significant vaginal epithelial cell cornification at any of the tested doses. The results suggested that diisohexyl phthalate lacks significant estrogenic activity in vivo<sup>[3]</sup>. Diisohexyl phthalate (25 $\mu$ M) treated B6C3F1 mice administered through ear five times weekly for two weeks had no significant effect on levels of serum IgE, IL-4, or IL-13 protein, or IL-4 or IL-13 mRNA, which indicated that Diisohexyl phthalate has little, if any, potential to produce antibody-mediated respiratory allergy<sup>[4]</sup>.

### References:

- [1] Takeuchi S, Iida M, Kobayashi S, et al. Differential effects of phthalate esters on transcriptional activities via human estrogen receptors alpha and beta, and androgen receptor. Toxicology. 2005 Jun 1;210(2-3):223-33.
- [2] Fung YS, Tang A.S. Liquid chromatographic determination of the plasticizer di(2-ethylhexyl) phthalate (DEHP) in PVC plastics. Fresenius' Journal of Analytical Chemistry. 1994, Volume 350, Issue 12, pp 721-723.
- [3] Zacharewski T.R., Meek M.D., Clemons J.H., et al. Examination of the in Vitro and in Vivo Estrogenic Activities of Eight Commercial Phthalate Esters Toxicological Sciences. 1998; 46, 282–293

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[4] Butala JH, David RM, Gans G, et al. Phthalate treatment does not influence levels of IgE or Th2 cytokines in B6C3F1 mice. *Toxicology*. 2004 Sep 1;201(1-3):77-85.

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