

ADME NTP Study S0054 Di(2-ethylhexyl) phthalate

The contractor used the abbreviation DEHP for the test article.

Sex/Species: male F344 rats.

Vehicle: dermal, absolute ethanol.

CASRN 117-81-7

Radiolabeled with carbon-14 in the phthalyl moiety; Di(2-ethylhexyl) phthalate, [¹⁴C-U-phthalyl]

Studies Performed:

- Single 30.0 mg/kg dermal dose to rats with covered dose site and sacrifice 7 days postdose. (n = 3)

Di(2-ethylhexyl) phthalate is one of nine phthalates that were tested together to determine excretion and tissue distribution after dermal administration. Comparison data for tissue distribution with di-isodecyl phthalate (DIDP) is shown in Table 2. The comparison data for all nine phthalates is found in the dimethyl phthalate study S0043.

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Table 1. Excretion profile of DEHP in the urine and the feces after dermal application to the rat*

Time (hr)	% Dose Excreted		
	Urine	Feces	Urine & Feces ($\Sigma \bar{X}$)
24	0.28 ± 0.07	0.14 ± 0.02	0.42
48	0.57 ± 0.1	0.2 ± 0.16	0.77
72	0.64 ± 0.22	0.29 ± 0.26	0.93
96	1. ± 0.6	0.69 ± 0.33	1.69
120	0.5 ± 0.07	0.8 ± 0.35	1.3
Total	2.99 ± 1.05	2.12 ± 0.74	5.11

*Male F-344 rats (200 ± 20 gm) received DEHP in ethanol dermally (30 mg/Kg). The skin was covered with a perforated plastic cap. Data points are the mean ± standard deviation. The % dose excreted represents the fraction of the dose found as the ¹⁴C-equivalent relative to the total ¹⁴C-equivalent applied.

Table 2. Tissue distribution of di-(2-ethyl hexyl) phthalate and di-isodecyl phthalate after 7 days of dermal exposure

Tissue	% Dose Found ($\bar{X} \pm$ S.D., n = 3)	
	DEHP	DIDP
Brain	0.006 \pm 0.005	0.08 \pm 0.08
Lung	0.005 \pm 0.006	0.015 \pm 0.08
Liver	0.063 \pm 0.017	0.058 \pm 0.032
Spleen	0.001 \pm 0.0003	0.002 \pm 0.002
Small Intestine	0.161 \pm 0.158	0.019 \pm 0.011
Kidney	0.012 \pm 0.001	0.01 \pm 0.01
Testis	0.002 \pm 0.001	0.006 \pm 0.003
Fat	0.066 \pm 0.028	0.149 \pm 0.027
Muscle	1.162 \pm 0.22	0.338 \pm 0.05
Skin	0.298 \pm 0.286	0.095 \pm 0.035
Spinal Cord	0.002 \pm 0.0001	0.034 \pm 0.027
Blood	0.023 \pm 0.001	0.015 \pm 0.003
Skin Area of Application	86.74 \pm 16.98	75.88 \pm 1
Plastic Cap	12.163 \pm 3.48	5.571 \pm 2.77
Total Recovery*	105.8 \pm 16.602	82.73 \pm 12.196

*Total recovery represents the sum of the % dose found in the urine, the feces, the tissues and the plastic cap in 7 days.

*Dose applied was 30 mg/kg.