Tinwell and Ashby, 2004

Guidelines/Criteria	
Reference:	Tinwell H, Ashby J. 2004. Sensitivity of the immature rat uterotrophic assay to mixtures of estrogens. Environ Health Perspect 112(5):575-582.
In vivo **Study Type** Route of Administration Species & age of animals	Immature rat uterotrophic assay sc injection Rat, 19 - 20 days old
Study Duration	3 days
Type of Mixture Binary >2 components Similar acting or dissimilar What Mode of Action was investigated?	 Seven oestrogenic chemicals Similar acting oestrogenic activity
Parameters/End points Measured Target organs/Critical effects Pharmacological changes or adverse effects	 Uterus uterine weight 24h after last dose
Individual Components Characterisation of individual compounds Name, exact chemical name, CAS no. Were dose responses established for individual components? Were no effect levels established? Were doses below the NO(A)ELs investigated?	 bisphenol A genistein Nonylphenol Methoxychlor 17bestradiol diethylstilbestrol ethinylestradiol in part - based on previously published data (for OECD validation programme, which included authors own data) Yes Yes
Mixtures Investigated Number of dose levels How does the mixture make-up compare to individual components? (e.g. low dose) equivalents used?) No. of technical replicates per exposure condition (*in vitro*) No. of animals per dose group (*in vivo*)	 7 dose levels 1/2, 1/5; 1/10, 1/20, 1/50, 1/100, 1x LOEL 8 animals/group
Observations/Findings	At low doses no effect on uterine weight, clear significant increase in UT weight recorded from 1/10 LOEL
Overall opinion (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	 Sufficient dose levels investigated. Dose levels below LOEL investigated. Valid paper to include in the Task Force's review.