

Guidelines/Criteria	
	Reference: Silva E, Rajapakse N, Kortenkamp A. 2002. Something from "Nothing" - Eight weak estrogenic chemicals combined at concentrations below NOECs produce significant mixture effects. Environ Sci Technol 36:1751-1756.
<b>In vitro Study Type</b> Route of Administration Species & age of animals	
<b>Study Duration</b>	? Yeast oestrogen screen (protocol 5 days)
<b>Type of Mixture</b> Binary >2 components Similar acting or dissimilar What Mode of Action was investigated?	8 components similar acting receptor activation
<b>Parameters/End points Measured</b> Target organs/Critical effects Pharmacological changes or adverse effects <i>In vitro</i>	oestrogen receptor activation
<b>Individual Components</b> 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?	designed mixture 2,3,4,5-tetrachloro-4'-biphenylol 2,5-dichloro-4'-biphenylol 4-chloro-4'-biphenylol genistein 2,4-dihydroxybenzophenone benzyl-4-hydroxyparabene bisphenol A resorcinol monobenzoate yes; each component tested at 10 concentrations yes NOECs and EC01s yes
<b>Mixtures Investigated</b> 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 ( <i>in vitro</i> )  No. of animals per dose group ( <i>in vivo</i> )	10 fixed mixture ratio - full dose response  run in duplicate within the same experiment and replicate experiments run 2 or 3 times
<b>Observations/Findings</b>	Dose addition accurately predicted mixture effects. Independent action / effect summation significantly underestimated joint effects. Mixtures where each component present at below NOEC or EC01s caused statistically significant effects.
<b>Overall opinion</b> (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	An <i>in vitro</i> receptor based assay - and has the limitations associated with the test method.