

<b>Guidelines/Criteria</b>	
Reference:	Perez-Carreón JI, Dargent C, Merhi M, Fattel-Fazenda S, Arce-Popoca E, Villa-Treviño S, Rouimi P. 2009. Tumor promoting and co-carcinogenic effects in medium-term rat hepatocarcinogenesis are not modified by co-administration of 12 pesticides in mixture at acceptable daily intake. Food Chem Toxicol 47:540-546.
<b>In vivo Study Type</b> Route of Administration Species & age of animals	gavage, 5 days/week Male F344 rats
<b>Study Duration</b>	8 weeks
<b>Type of Mixture</b> Binary >2 components Similar acting or dissimilar  What Mode of Action was investigated?	no yes dissimilar action assumed (all used pesticides were carcinogenic in animal studies) Hepatocarcinogenicity
<b>Parameters/End points Measured</b> Target organs/Critical effects  Pharmacological changes or adverse effects	Liver (modified Solt-Farber model for hepatocarcinogenesis) Induction with DEN and treatment with test substance  Altered hepatocyte foci or histological analysis of liver GGT+ lesions, RT-PCR determination of hepatic Gstp mRNA levels, Western blot analysis of liver GSTP protein level
<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?	yes A mixture of Alachlor (15972-60-8), Atrazine (1912-24-9), Carbofuran (CAS 1563-66-2), Chlorpyrifos (CAS 2921-88-2), Diazinon (CAS 333-41-5), Dicofof (CAS 115-32-2), Endosulfan (CAS 115-29-7), Iprodione (CAS 36734-19-7), Mancozeb, Maneb (CAS 12427-38-2), Procymidone (CAS 32809-16-8), Rotenone (CAS 83-79-4) was tested No, the mixtures at two dose levels (1 and 10x ADI) were administered No (not in the actual study) Yes (based on literature data)
<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> )	2 dose groups each containing the individual compounds at the following doses (representing 1x, 10x, of the ADI): Alachlor: 0.0002/0.002 mg/L, Atrazine: 0.0001/0.001 mg/L, Carbofuran 0.0008/0.008 mg/L (ADI: 0.002 mg/kg bw), Chlorpyrifos 0.004/0.04 mg/L (ADI 0.01 mg/kg bw), Diazinon 0.0008/0.008 mg/L (ADI 0.002 mg/kg bw), Dicofof 0.001/0.01 mg/L (ADI 0.002 mg/kg bw), Endosulfan 0.0024/0.024 mg/L (0.006 mg/kg bw), Iprodione 0.024/0.24 mg/L (ADI 0.06 mg/kg bw), Mancozeb 0.02/0.2 mg/L (ADI 0.03 mg/kg bw), Maneb 0.02/0.2 mg/L (ADI 0.03 mg/kg bw), Procymidone 0.04/0.4 mg/L (0.1 mg/kg bw, Rotenone 0.05/0.5 mg/L  Each dose group corresponded most likely to a low dose  not applicable 5-9 rats / dose group
<b>Observations/Findings</b>	No effects
<b>Overall opinion</b> (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	Limited study design, only 5-9 animals per dose group, test substances well characterised, ADIs not for all pesticides available.