

## CLINICAL SPECIFICATIONS

# BENZENE RING COMPOUNDS

### Chemical Found In:

Benzene is found in crude oil and because it has a high octane number, it is utilized in gasoline. Benzene is also used as a precursor to heavy chemicals (ethylbenzene, cumene). Benzene was formerly an important solvent especially in the rubber and surface coating industries.

### Sources:

<https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=14>

### Known Cross-Reactions:

### Clinical Significance:

The detection of antibodies to Benzene Ring Compounds bound to human protein in serum indicates a breakdown in immunological tolerance and induction of chemical intolerance. Benzene or its metabolites can bind to human tissue proteins and form neo-antigens. These new antigens are comprised of the haptenic chemical plus the tissue antigen. The formation of neo-antigens initiates an immune response which may result in antibody production against the chemical and the human tissue. Continued exposure to the chemical and the subsequent production of antibodies against various tissue antigens, may result in autoimmune reactivity.

Persons with antibodies to Benzene Ring bound to human protein in serum should avoid exposure to the substance.

### References:

1. ATSDR (Agency for Toxic Substances and Disease Registry). 2007. Toxicological Profile of Benzene. Available: <http://www.atsdr.cdc.gov/toxprofiles/tp3.pdf> [accessed 19 July 2010].
2. Ithnin, et al. Effects of pollutant diesel fuels on neurobehavioral performance among workers in locomotive depot. *Am J Environ Sci*, 2011; 7(3):248-253.
3. Lee, et al. Acquired dyschromatopsia among petrochemical industry workers exposed to benzene. *Neuro Toxicology*, 2007; 28:356-363.
4. Lupo, et al. Maternal exposure to ambient levels of benzene and neural tube defects among offspring: Texas, 1999-2004. *Environ Health Perspect*, 2001; 119:397-402.
5. NIOSH. Health Hazard Evaluation Report No. 93-802-2338, 1993.