

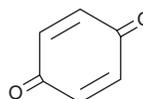
# PRODUCT INFORMATION



## 1,4-Benzoquinone

Item No. 27560

**CAS Registry No.:** 106-51-4  
**Formal Name:** 2,5-cyclohexadiene-1,4-dione  
**Synonyms:** *p*-Benzoquinone, NSC 36324, *p*-Quinone  
**MF:** C<sub>6</sub>H<sub>4</sub>O<sub>2</sub>  
**FW:** 108.1  
**Purity:** ≥98%  
**UV/Vis.:** λ<sub>max</sub>: 243 nm  
**Supplied as:** A crystalline solid  
**Storage:** -20°C  
**Stability:** ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Laboratory Procedures

1,4-Benzoquinone is supplied as a crystalline solid. A stock solution may be made by dissolving the 1,4-benzoquinone in the solvent of choice, which should be purged with an inert gas. 1,4-Benzoquinone is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of 1,4-benzoquinone in ethanol is approximately 10 mg/ml and approximately 30 mg/ml in DMSO and DMF.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of 1,4-benzoquinone can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of 1,4-benzoquinone in PBS, pH 7.2, is approximately 1 mg/ml. We do not recommend storing the aqueous solution for more than one day.

### Description

1,4-Benzoquinone is a toxic metabolite of benzene.<sup>1</sup> It is formed *via* hepatic metabolism of benzene to 1,4-hydroquinone followed by myeloperoxidase processing of 1,4-hydroquinone in bone marrow.<sup>2</sup> 1,4-Benzoquinone decreases levels of cytochrome P450 in a concentration-dependent manner in minipig liver microsomes.<sup>1</sup> It induces DNA mutations in human W138-VA13 and mouse HL18 cells.<sup>3</sup> 1,4-Benzoquinone (10 and 20 μM) disrupts mitochondrial membrane potential and reduces viability, increases production of reactive oxygen species (ROS), and induces apoptosis in a concentration-dependent manner in HL-60 cells.<sup>4</sup>

### References

1. Kondrová, E., Stopka, P., and Soucek, P. Cytochrome P450 destruction by benzene metabolites 1,4-benzoquinone and 1,4-hydroquinone and the formation of hydroxyl radicals in minipig liver microsomes. *Toxicol. In Vitro* **21(4)**, 566-575 (2007).
2. Lindsey, R.H., Jr., Bromberg, K.D., Felix, C.A., *et al.* 1,4-Benzoquinone is a topoisomerase II poison. *Biochemistry* **43(23)**, 7563-7574 (2004).
3. Nakayama, A., Koyoshi, S., Morisawa, S., *et al.* Comparison of the mutations induced by *p*-benzoquinone, a benzene metabolite, in human and mouse cells. *Mutat. Res.* **470(2)**, 147-153 (2000).
4. Sun, S., Zhang, C., Gao, J., *et al.* Benzoquinone induces ROS-dependent mitochondria-mediated apoptosis in HL-60 cells. *Toxicol. Ind. Health* **34(4)**, 270-281 (2018).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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