

# [Phosphates: nickel (ni), and chromium (cr). chromium](https://assignbuster.com/phosphates-nickel-ni-and-chromium-cr-chromium/)

[Design](https://assignbuster.com/essay-subjects/design/)

Phosphates: Zincdialkyldithiophosphate (ZDDP) is an antiwear, antioxidant, and corrosioninhibiting additive that is used in engine lubricating oils, hydraulic oils, and other lubricants. ZDDP is produced by first letting an alkyl or arylalcohol react with phosphorous pentasulphide (P2S5), and then neutralizing theresultant acid with zinc oxide. 37 The phosphorus composition  depends on many factors, such as the chemicalcomposition of oil and oil additives, the age of the oil used, and conditionsin the motor 38. Phosphorus contamination can be observed on thesurface of catalytic converters as several different compounds Secondly, phosphate compounds can alsobe formed directly with washcoat components. In that case, the resultingcompounds are, for instance, aluminium and cerium phosphates Poisoningby other compounds  Automotive catalysts can also bedeactivated by compounds commonly used in the structure of an engine. The , iron (Fe) is a poison for platinum group metals39 .

Iron detectedon the catalytic surface is often assumed to originate from the corrosion ofmetal components in the engine. Other similar impurities may be copper (Cu), nickel (Ni), and chromium (Cr). Chromium and nickel are added to theconstruction materials in order to improve the thermal stability of engines.    Effects on PGM  Precious metals have different types ofresistance against poisoning.

Palladium is more sensitive than platinum andrhodium to chemical deactivation, in particular to poisoning by sulfur and lead40, 41.  Pd is easily oxidized at room temperature toPdO and it reduces to metallic Pd in the temperature range of 500°– 1200°C. At normal operation temperatures of thecatalytic converter, Rh is in the form of Rh2O3, if theoxidation of Rh is kinetically favoured.

The oxygen content in the exhaust gasstrongly affects the formation of Rh oxides; the higher the amount of oxygen, the higher the transition temperature is.