



Introduction to Lead Safety

HOUSEHOLD AND YARD LEAD SAFETY

ABOUT GROUNDED

Grounded works to improve the social, economic, and environmental health of distressed communities by building capacity to reclaim vacant and underutilized land.

- Transforms land use liabilities into community assets.
- Develops individual capacity through education, resources, and partnership.
- Equips people to take steps towards creating clean, green, and liveable spaces and to weigh in on the systems that affect them.



CAPACITY-BUILDING RESOURCES



Pgh Mobile
Toolbox



Lots to Love



Refresh Fund



Land Doctor

GOALS FOR THIS PRESENTATION

- Understand where lead (Pb) is likely to be found in the home
- Learn signs and symptoms of Pb exposure
- Connect with resources to help you test for and remediate Pb on your property
- Gain enough knowledge about Pb on residential property to warn your neighbors of the risk!

WHAT IS LEAD?

<https://www.wikihow.com/Sample/Periodic-Table>

The Periodic Table of the Elements

By Robert Campion version 1.4

group 1 2 13 14 15 16 17 18

period 1 2 3 4 5 6 7

atomic mass
or most stable mass number
1st ionization energy
in kJ/mol

atomic number

electronegativity

chemical symbol

name

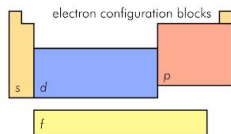
electron configuration

alkali metals
alkaline metals
other metals
transition metals
lanthanoids
actinoids

metalloids
nonmetals
halogens
noble gases
unknown elements
radioactive elements have masses in parenthesis

oxidation states
most common are bold

1.00794 1312.0 1 H Hydrogen 1s ¹	6.941 520.2 3 Li Lithium 1s ² 2s ¹	9.012182 899.5 4 Be Beryllium 1s ² 2s ²	22.98976 498.8 11 Na Sodium [Ne] 3s ¹	24.3050 737.7 12 Mg Magnesium [Ne] 3s ²	44.95591 633.1 21 Sc Scandium [Ar] 3d ¹ 4s ²	47.867 633.1 22 Ti Titanium [Ar] 3d ² 4s ²	50.9415 650.9 23 V Vanadium [Ar] 3d ³ 4s ²	51.9962 652.9 24 Cr Chromium [Ar] 3d ⁵ 4s ¹	54.93804 717.3 25 Mn Manganese [Ar] 3d ⁵ 4s ²	55.845 762.5 26 Fe Iron [Ar] 3d ⁶ 4s ²	58.93319 762.5 27 Co Cobalt [Ar] 3d ⁷ 4s ²	58.6934 737.1 28 Ni Nickel [Ar] 3d ⁸ 4s ²	63.546 745.5 29 Cu Copper [Ar] 3d ¹⁰ 4s ¹	65.38 906.4 30 Zn Zinc [Ar] 3d ¹⁰ 4s ²	69.723 577.5 31 Ga Gallium [Ar] 3d ¹⁰ 4s ² 4p ¹	72.64 786.5 32 Ge Germanium [Ar] 3d ¹⁰ 4s ² 4p ²	74.92160 786.5 33 As Arsenic [Ar] 3d ¹⁰ 4s ² 4p ³	78.96 999.6 34 Se Selenium [Ar] 3d ¹⁰ 4s ² 4p ⁴	79.904 1139.9 35 Br Bromine [Ar] 3d ¹⁰ 4s ² 4p ⁵	83.798 1520.8 36 Kr Krypton [Ar] 3d ¹⁰ 4s ² 4p ⁶	85.4678 403.0 37 Rb Rubidium [Kr] 5s ¹	87.62 549.5 38 Sr Strontium [Kr] 5s ²	88.90585 600.0 39 Y Yttrium [Kr] 4d ¹ 5s ²	91.224 640.1 40 Zr Zirconium [Kr] 4d ² 5s ²	92.90638 640.1 41 Nb Niobium [Kr] 4d ⁴ 5s ¹	95.96 652.1 42 Mo Molybdenum [Kr] 4d ⁵ 5s ¹	(98) 652.1 43 Tc Technetium [Kr] 4d ⁵ 5s ²	101.07 719.7 44 Ru Ruthenium [Kr] 4d ⁷ 5s ¹	102.9055 719.7 45 Rh Rhodium [Kr] 4d ⁸ 5s ¹	106.42 804.4 46 Pd Palladium [Kr] 4d ¹⁰	107.8682 731.0 47 Ag Silver [Kr] 4d ¹⁰ 5s ¹	112.414 867.8 48 Cd Cadmium [Kr] 4d ¹⁰ 5s ²	114.818 588.3 49 In Indium [Kr] 4d ¹⁰ 5s ² 5p ¹	118.710 706.8 50 Sn Tin [Kr] 4d ¹⁰ 5s ² 5p ²	121.760 834.0 51 Sb Antimony [Kr] 4d ¹⁰ 5s ² 5p ³	127.60 869.3 52 Te Tellurium [Kr] 4d ¹⁰ 5s ² 5p ⁴	126.9044 1008.4 53 I Iodine [Kr] 4d ¹⁰ 5s ² 5p ⁵	131.293 1170.4 54 Xe Xenon [Kr] 4d ¹⁰ 5s ² 5p ⁶	132.9054 403.0 55 Cs Cesium [Xe] 6s ¹	137.327 502.9 56 Ba Barium [Xe] 6s ²	174.9668 502.9 71 Lu Lutetium [Xe] 4f ¹⁴ 5d ¹ 6s ²	178.49 689.5 72 Hf Hafnium [Xe] 4f ¹⁴ 5d ² 6s ²	180.9478 761.0 73 Ta Tantalum [Xe] 4f ¹⁴ 5d ³ 6s ²	183.84 761.0 74 W Tungsten [Xe] 4f ¹⁴ 5d ⁴ 6s ²	186.207 761.0 75 Re Rhenium [Xe] 4f ¹⁴ 5d ⁵ 6s ²	190.23 761.0 76 Os Osmium [Xe] 4f ¹⁴ 5d ⁶ 6s ²	192.217 761.0 77 Ir Iridium [Xe] 4f ¹⁴ 5d ⁷ 6s ²	195.084 761.0 78 Pt Platinum [Xe] 4f ¹⁴ 5d ⁹ 6s ¹	196.9665 1007.1 79 Au Gold [Xe] 4f ¹⁴ 5d ¹⁰ 6s ¹	200.59 1007.1 80 Hg Mercury [Xe] 4f ¹⁴ 5d ¹⁰ 6s ²	204.3833 589.4 81 Tl Thallium [Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ¹	207.2 703.0 82 Pb Lead [Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ²	208.9804 703.0 83 Bi Bismuth [Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ³	(210) 812.1 84 Po Polonium [Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁴	(210) 812.1 85 At Astatine [Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁵	(220) 1037.0 86 Rn Radon [Xe] 4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁶	(223) 380.0 87 Fr Francium [Rn] 7s ¹	(226) 509.3 88 Ra Radium [Rn] 7s ²	(262) 470.0 103 Lr Lawrencium [Rn] 5f ¹⁴ 7s ² 7p ¹	(261) 470.0 104 Rf Rutherfordium [Rn] 5f ¹⁴ 7s ² 7p ²	(262) 470.0 105 Db Dubnium [Rn] 5f ¹⁴ 7s ² 7p ³	(266) 470.0 106 Sg Seaborgium [Rn] 5f ¹⁴ 7s ² 7p ⁴	(264) 470.0 107 Bh Bohrium [Rn] 5f ¹⁴ 7s ² 7p ⁵	(277) 470.0 108 Hs Hassium [Rn] 5f ¹⁴ 7s ² 7p ⁶	(268) 470.0 109 Mt Meitnerium [Rn] 5f ¹⁴ 7s ² 7p ⁷	(271) 470.0 110 Ds Darmstadtium [Rn] 5f ¹⁴ 7s ² 7p ⁸	(272) 470.0 111 Rg Roentgenium [Rn] 5f ¹⁴ 7s ² 7p ⁹	(285) 470.0 112 Cn Copernicium [Rn] 5f ¹⁴ 7s ² 7p ¹⁰	(284) 470.0 113 Uut Ununtrium [Rn] 5f ¹⁴ 7s ² 7p ¹¹	(289) 470.0 114 Uuq Ununquadium [Rn] 5f ¹⁴ 7s ² 7p ¹²	(288) 470.0 115 Uup Ununpentium [Rn] 5f ¹⁴ 7s ² 7p ¹³	(292) 470.0 116 Uuh Ununhexium [Rn] 5f ¹⁴ 7s ² 7p ¹⁴	(294) 470.0 117 Uus Ununseptium [Rn] 5f ¹⁴ 7s ² 7p ¹⁵	(294) 470.0 118 Uuo Ununoctium [Rn] 5f ¹⁴ 7s ² 7p ¹⁶
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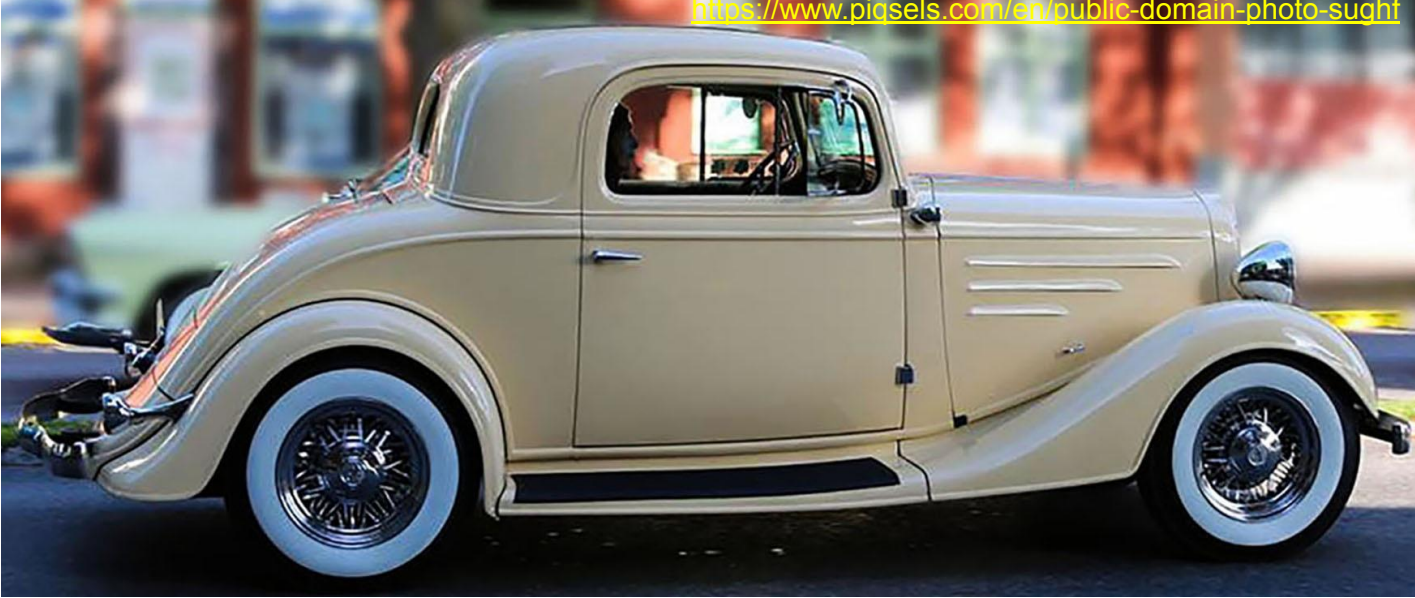
notes

- as of yet, elements 113-118 have no official name designated by the IUPAC.
- 1 kJ/mol = 96.485 eV.
- all elements are implied to have an oxidation state of zero.

138.9054 534.1 57 La Lanthanum [Xe] 5d ¹ 6s ²	140.116 534.4 58 Ce Cerium [Xe] 4f ¹ 5d ¹ 6s ²	140.9076 527.0 59 Pr Praseodymium [Xe] 4f ³ 6s ²	144.242 533.1 60 Nd Neodymium [Xe] 4f ⁴ 6s ²	(145) 544.5 61 Pm Promethium [Xe] 4f ⁵ 6s ²	150.36 544.5 62 Sm Samarium [Xe] 4f ⁶ 6s ²	151.964 547.1 63 Eu Europium [Xe] 4f ⁷ 6s ²	157.25 593.4 64 Gd Gadolinium [Xe] 4f ⁷ 5d ¹ 6s ²	158.9253 565.8 65 Tb Terbium [Xe] 4f ⁹ 6s ²	162.500 573.0 66 Dy Dysprosium [Xe] 4f ¹⁰ 6s ²	164.9303 581.0 67 Ho Holmium [Xe] 4f ¹¹ 6s ²	167.259 589.3 68 Er Erbium [Xe] 4f ¹² 6s ²	168.9342 596.7 69 Tm Thulium [Xe] 4f ¹³ 6s ²	173.054 603.4 70 Yb Ytterbium [Xe] 4f ¹⁴ 6s ²
(227) 499.0 89 Ac Actinium [Rn] 6d ¹ 7s ²	232.0380 587.0 90 Th Thorium [Rn] 6d ² 7s ²	231.0358 568.0 91 Pa Protactinium [Rn] 5f ² 6d ¹ 7s ²	238.0289 597.6 92 U Uranium [Rn] 5f ³ 6d ¹ 7s ²	(237) 604.5 93 Np Neptunium [Rn] 5f ⁴ 6d ¹ 7s ²	(244) 581.0 94 Pu Plutonium [Rn] 5f ⁶ 7s ²	(243) 578.0 95 Am Americium [Rn] 5f ⁷ 7s ²	(247) 581.0 96 Cm Curium [Rn] 5f ⁷ 6d ¹ 7s ²	(247) 601.0 97 Bk Berkelium [Rn] 5f ⁹ 7s ²	(251) 608.0 98 Cf Californium [Rn] 5f ¹⁰ 7s ²	(252) 619.0 99 Es Einsteinium [Rn] 5f ¹¹ 6s ²	(257) 627.0 100 Fm Fermium [Rn] 5f ¹² 7s ²	(258) 635.0 101 Md Mendelevium [Rn] 5f ¹³ 7s ²	(259) 642.0 102 No Nobelium [Rn] 5f ¹⁴ 7s ²

WHY IS LEAD ON MY PROPERTY?

<https://www.piqsels.com/en/public-domain-photo-sugf>



- Between the 1930s and the 1970s, Pb was commonly added to automobile fuel. It is still added to fuel for some types of aircraft. Exhaust from any of these vehicles disperses Pb into the environment.
 - Since 1996, the use of leaded gasoline for on-road vehicles has been banned in the United States.
 - Soils recovered near roads constructed before this point **STILL** (almost a quarter century later) contain elevated lead levels.

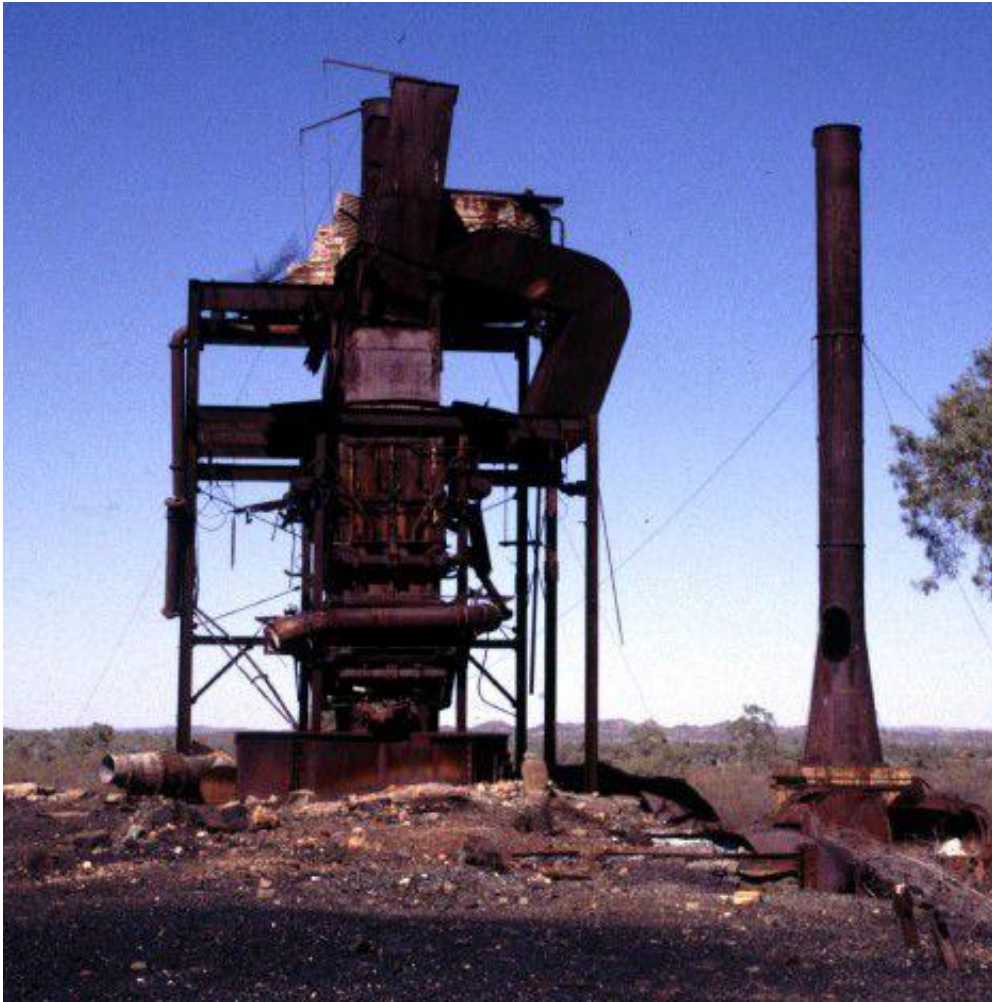
WHY IS LEAD ON MY PROPERTY?

- Lead has been used as a pigment for paint since at least 400 BCE, with usage in the United States peaking between 1910 and 1930.
 - Lead was banned from use in housing/toys in 1978, so if your residence was constructed or renovated before this date, you should definitely have your property tested.



<https://clearcorpsdetroit.org/lead-faq/a-history-of-lead/>

WHY IS LEAD ON MY PROPERTY?



- In older industrial cities, it is not uncommon to find areas where industrial by-products (slags, etc.) have been used as fill to level a site before construction.
- Decommissioned industrial sites (like mines, smelters, refineries, and metal plating facilities) have sometimes been developed into housing or commercial developments.
 - Old firing ranges and military installations often have elevated lead levels due to Pb-based ammunition.

WHY IS LEAD ON MY PROPERTY?



Historic Locations of Smelters in and around Pittsburgh PA

- 2815 SMALLMAN STREET
- 50TH & 33RD STREET
- 615 GROSS STREET
- 1247 REEDSDALE
- 3000 LIBERTY AVE
- 4314 MAIN STREET
- 100 W ELIZABETH AVE
- GLOSTER STREET AND PATH WAY
- 3116 PENN AVE

Source: [USEPA List of Sites with Potential Smelting Related Operations](#)

WHY IS LEAD ON MY PROPERTY?

- Prior to 1986, lead based plumbing fixtures were freely utilized to install much of the water infrastructure in the United States.
- In 1986, lead-based plumbing was 'banned' for new installations (pipes up to 8% Pb by weight were still permissible to install).
- In 2014, a new maximum (0.25% Pb by weight) was introduced for all new plumbing installations.
 - Given that the vast majority of water infrastructure was installed prior to the 1986 policy change, it is prudent to test both your water and plumbing system for lead.



<http://viroqua-wisconsin.com/city-of-viroqua/departments/water-sewer/water-department/viroqua-water-system-lead/identifying-water-service-line>