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| **Environmental Enlightenment #238** By Ami Adini - Issued February 19, 2018   |  | | --- | | This is a SHORT, LIGHT and SIMPLE newsletter. Its purpose is to rekindle in the initiated concepts they have once learned, and enlighten the uninitiated on concepts they may have never heard of, but will understand once they are introduced to them. | | **Detection by Light**  Old painting technologies used to have lead as a chemical component. Lead is toxic. Especially to children.  http://amiadini.com/NewsletterArchive/180219-NL238/envEnl-238_clip_image001.jpg <http://health.hawaii.gov/irhb/lead/>  In dealing with older buildings we want to know if they are painted with lead-based paint. A quick, on-location way is X-Ray Fluorescence (XRF).  Almost all substances give off light when exposed to certain rays; and the qualities of the light that they give off depend on the nature of the impinging rays and the nature of the exposed substance.  The “white” sunlight hits the grass, and the grass emits green light. It hits the poppies, and they throw orange beams back at us.  http://amiadini.com/NewsletterArchive/180219-NL238/envEnl-238_clip_image002.jpg [Pixabay.com](http://pixabay.com/)  “Fluorescence” is giving off light from a substance, that continues as long as the substance is exposed to certain rays (X-rays and ultra violet rays). The substance transforms the radiation coming in to rays of different wavelengths or colors going out.  This is how it works:   High-energy photons (x-rays) hit an atom of an element.   An atom is made of a tiny core (nucleus) surrounded by electrons revolving in the distance. The electrons revolve in a sphere-like envelope called a "shell."  http://amiadini.com/NewsletterArchive/180219-NL238/envEnl-238_clip_image003.jpg [www.thermofisher.com](http://www.thermofisher.com/)  Lead, a heavy element, has 82 electrons revolving in 6 shells.   When you zap an atom with X-rays, they hit and displace inner shell electrons.   Outer shell electrons then fall into the vacancy left by the displaced electrons. In doing so, they normally emit light (fluoresce). The wavelength of light emitted is characteristic of the element, and the intensity of light emitted is proportional to the element's concentration in the material.  http://amiadini.com/NewsletterArchive/180219-NL238/envEnl-238_clip_image004.jpg  Detection limits for XRF are generally in the 1 part-per-million (ppm) range for heavy elements. Elements lighter than Sodium (Na) are difficult or impossible to detect. Lead is much heavier than Sodium and is easy to detect with XRF. | | You can find past issues of our "Environmental Enlightenment" at [amiadini.com](http://www.amiadini.com/) Wealth of information about environmental site assessments in the real estate transactions and issues concerning assessment and cleanup of contamination in the subsurface soil and groundwater. |  |  | | --- | | Call me if you have any questions. There are **no obligations.**  Ami Adini Environmental Services, Inc. Environmental Consultants & General Engineering Contractors California Lic. #1009513 A B HAZ ASB **818-824-8102**; [**mail@amiadini.com**](mailto:mail@amiadini.com) [www.amiadini.com](http://amiadini.com/)  Ami Adini is a veteran environmental practitioner with over 40 years of experience. He carries a Bachelor of Science degree (B.Sc.) in Mechanical Engineering including academic credits in Nuclear and Chemical Engineering and postgraduate education in these fields. His career includes design and construction of nuclear plant facilities, chemical processing plants and hazardous wastewater treatment systems. He is a former California Registered Environmental Assessor Levels I & II in the 1988-2012 registry that certified environmental professionals in the assessment and remediation of environmentally impacted land, and a Registered Environmental Professional (REP) since 1989 with the National Registry of Environmental Professionals (NREP). He is a California Business & Professions Code Qualifying Responsible Managing Officer (RMO) in the General Engineering Contractor classification with Hazardous Substance Removal and Asbestos certifications, and president of AMI ADINI ENVIRONMENTAL SERVICES, INC. (AAES), a general engineering contractor and consulting firm specializing in environmental site assessments, rehabilitation of contaminated sites and removal of environmental risks from real-estate transactions. (Contact Ami for a complete resume.)   **AAES provides practical solutions to environmental concerns using the highest standards of ethics and integrity while providing its clients with maximum return on their investments.** | |