

events that is useful up to 40,000 years ago and in some special cases for longer periods. It is useful for dating fossils that contain organic (biologically produced) carbon such as shells, bones, and dead wood.

Nitrogen is the most abundant gas in the atmosphere, and it consists of stable nuclides, principally nitrogen 14. Cosmic rays are high energy particles from unknown sources in space that occasionally strike the nitrogen 14 nuclides to substitute a neutron for a proton in its nucleus. As a result, nitrogen 14 is converted into carbon 14. The relatively small quantities of carbon 14 nuclides combine with oxygen to form carbon dioxide. These molecules mix with the more stable carbon dioxide formed from nuclides of carbon 12 and carbon 13 and

THE CHIEF METHODS OF RADIOMETRIC-AGE DETERMINATION

<i>Parent nuclide</i>	<i>Half-life (years)</i>	<i>Daughter nuclide</i>	<i>Minerals & rocks commonly dated</i>
Uranium-238	4,510 million	Lead-206	Zircon Uraninite Pitchblende
Uranium-235	713 million	Lead-207	Zircon Uraninite Pitchblende
Potassium-40	1,300 million	Argon-40	Muscovite Biotite Hornblende Glauconite Sanidine Whole volcanic rock
Rubidium-87	47,000 million	Strontium-87	Muscovite Biotite Lepidolite Microcline Glauconite Whole metamorphic rock

Table A1.1.