



FIGURE 6.18 (a) Crystalline (nonglassy) igneous rocks are distinguished from one another by their grain size and composition. The right side of the chart shows the percentages of different minerals in the different rock types. To read this chart, draw a horizontal line next to a rock name; the minerals that the line crosses are the minerals found in that rock. (For example, granite [line X-X'] includes K-feldspar, quartz, plagioclase, amphibole, and biotite.) (b) The principal types of glassy and fragmental igneous rocks can be separated into several categories.

that the glass shards weld together. Tuff that settles from air is called “air-fall tuff,” and tuff formed by the welding together of hot shards is called “welded tuff.”

- **Volcanic breccia** consists of larger fragments of volcanic debris, either that fall through the air and accumulate, or that form when a flow breaks into pieces that accumulate.
- **Hyaloclastite** is formed from lava that erupts under water or ice, and cools so quickly that it shatters into fragments that then weld or cement together.

6.9 WHERE DOES IGNEOUS ACTIVITY OCCUR, AND WHY

If you look at a map showing the distribution of igneous activity—the formation, movement, and in some cases the eruption of molten rock—around the world (►Fig. 6.1), you see that igneous activity occurs in four settings: (1) volcanic arcs bordering deep-ocean trenches, (2) hot spots, (3) within continental rifts, and (4)