wide temperature interval, with much of the interval occupied by crystallization of olivine as the only silicate phase. The combination of the low viscosity and the tendency of olivine to display a wide range of crystal forms depending on the conditions of growth, accounts for much of the observed diversity.

This chapter will focus on two fundamental questions: how komatiites were erupted and emplaced, and how komatiites crystallized. Along the way we will encounter two important paradoxes: komatiites commonly form unusually thick flows despite the low viscosity of the liquids; and komatiite flows contain spectacularly dendritic textures, which imply high cooling rates but which are developed within the slowly-cooled interiors of thick flows.

9.2 Nomenclature and terminology

It is necessary to define some terms at the outset. We adopt much of the nomenclature used by volcanologists who have studied subaerial and submarine basalts in the Hawaiian islands (e.g., Walker (1970)). A *lava flow* is the product of a single, uninterrupted eruption from the same source, and a *lava flow field* forms by multiple sequential eruptions from the same source. *Cooling units* are bodies of igneous rock bounded by distinct continuous cooling surfaces. *Simple flows* are composed of single cooling units, whereas *compound flows* are composed of multiple overlapping cooling units formed during the same eruptive event.

Simple flows may be *massive*, or texturally and/or geochemically *differentiated*. The terms *differentiation* and *fractionation* have been used synonymously in igneous petrology to describe the formation of a variety of rock compositions from a single parental composition. In this chapter *differentiation* is used to indicate macroscopic textural and/or compositional variations within a single cooling unit due to the physical–chemical segregation of crystalline and liquid components, whether by gravity settling, fractional crystallization or other processes such as flowage differentiation.

Compound flows may be composed of many small rounded tubular units (*pillows*), multiple thin overlapping sheets (*flow lobes*), or thicker *sheet flows*, comprising combinations of volcaniclastic, pillow and/or massive lava (see Dimroth *et al.* (1978)). Many flows are fed by *lava pathways*. *Lava channels* (also called *lava trenches*) are uncovered lava pathways, whereas *lava conduits* (larger) and *lava tubes* (smaller) are covered lava pathways. Lava channels crust over to form lava conduits.

By analogy with sedimentary and metamorphic lithofacies, we define *volcanic lithofacies* as rocks with similar textural (e.g., aphyric, volcaniclastic, vesicular, spinifex, porphyritic, crescumulate, orthocumulate, mesocumulate,