



## CHLORITE

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**CHLORITE** (Pers. *sang-e sabz*), a mineral consisting of a group of closely related hydrous magnesium aluminum silicates of exceedingly varied chemical compositions owing to isomorphous substitutions (particularly the heavy atoms Fe, Mn, Cr for the lighter atoms Mg, Si, Al). Because it is widely available in Persia and easily worked, chlorite has been used for millennia in the production of objects ranging from small beads and cylinder seals to large tombstones. The complex cell structure of chlorites consists of layers resembling those of mica and brucite in alternation. They occur fairly commonly in metamorphic stone deposits throughout a “crushed zone,” or complex belt, extending nearly the entire length of the Zagros range. Massive deposits of chlorite are also said to exist in the metamorphic zone near Zāhedān in eastern Persia.

Owing to the varied chemical composition and relative abundance of chlorite on the Persian plateau, it is exceedingly difficult to identify or “fingerprint” chemically specific deposits and thus to deduce patterns of exchange from comparison of the composition of trace elements in artifacts with those from known sources of the mineral. In one X-ray diffraction study of chlorites primarily from the Persian plateau (Kohl, Harbottle, and Sayre), however, it was possible, through semiquantitative analysis of basal-plane peak intensities, to distinguish at least four separate sources of chlorite used in antiquity.



Chlorite ranges in color from light gray to deep green and darkens when exposed to fire; it was highly valued during certain prehistoric periods. Elaborate stone vessels carved with repeating designs, both geometric and naturalistic, in an easily recognizable “intercultural style” (Kohl, 1978; idem, 1979; see [Plate XLVIII](#)), were made primarily of chlorite; a number were produced at the important site of Tepe Yahya (Yaḥyā) southeast of Kermān in the middle and late 3rd millennium b.c.e. Some of these vessels were painted natural color (dark green) and inlaid with pastes and shell, and some have even been found with cuneiform inscriptions referring to rulers and known Sumerian deities. More than 500 vessels and vessel fragments (for the most complete current listing see Lamberg-Karlovsky) carved in this style have been recovered from sites ranging from Soviet Uzbekistan and the Indus Valley (e.g., Mohenjo-daro) in the east to Susa (de Miroschedji) and all the major Sumerian sites in Mesopotamia (see [Plate XLIX](#)), including Mari, in the west and to the Persian Gulf, particularly Tarut (Zarins) and the Failaka islands, in the south. Although the exact means by which these vessels were exchanged is uncertain, the evidence from analytical X-ray diffraction is unequivocal: The materials came from multiple sources. More than 80 percent of the materials analyzed were pure chlorites. Only a small proportion of objects carved in this style, chiefly from the site of Bismaya (Adab) in southern Mesopotamia, were made from steatite (talc), which is equally abundant and mineralogically related to chlorite but is softer (1.0 on the Moh’s scale) and has a soapier texture (hence the popular term “soapstone”). Artifacts of chlorite and similar soft green minerals have frequently and mistakenly been identified as made of steatite in the literature.

Chlorite vessels may have arrived in Kūzestān and Mesopotamia via routes across the Persian plateau and by sea through the Persian Gulf; possibly the latter trade was controlled by Early Dynastic Dilmun (Kohl, 1986). The discovery of these vessels in temples and “royal” graves in Sumer (Woolley, pl. 178), as well as in well-equipped graves at Šahdād near Kermān and on Tarut island (Hakemi, pl. XI), attest their ritual and funerary significance and leave no doubt of their status as luxury items for the “elite.” At approximately the same period at Shahr-i Sokhta (Šahr-e Sūkta) and other Bronze Age sites extending to the north and east of the Dašt-e Lūt chlorite was used primarily for seals and amulets of varying shapes with laboriously drilled, predominantly geometric designs (Kohl, 1977).



Slightly later, probably at the beginning of the 2nd millennium b.c.e., chlorites or compounds containing chlorite were used for small high-necked ointment jars, for compartmented bowls with curving or straight sides, and even for lidded vessels, some of them incised with relatively primitive representations of snakes and other animals. Typically these later chlorite artifacts were decorated with simple dot-in-circle designs formed by multiple drilling with tubular drills. They were also widely distributed, occurring as far east as northwestern Afghanistan (Ligabue and Salvatori, pls. 84-86) and as far south as Oman. Their use seems to have been less restricted than that of the earlier vessels, however, at least, they no longer functioned exclusively as luxury items charged with religious and symbolic significance.

Chlorites are still important today. Contemporary stone workshops in Mašhad, for example, use a compound of talc, chlorite, and dolomite (*sang-e sīāh*; Wulff, *Crafts*, p. 374) that occurs naturally in the mountains of Khorasan to produce fragile vessels of varying shapes and sizes, beautifully lacquered in black and gray. They are found throughout Persia, having been brought back as souvenirs by pilgrims to the holy shrine at Mašhad.

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Plate XLVIII. Two views of chlorite handle with opposed “combatant” snakes, Tepe Yahya IVB2. Courtesy of The Peabody Museum, Harvard University.

Plate XLIX. Chlorite bowl with inlaid procession of felines in “intercultural” style, from Nāṣerīya, near Ur, in southern Mesopotamia. Iraq Museum, Baghdad.