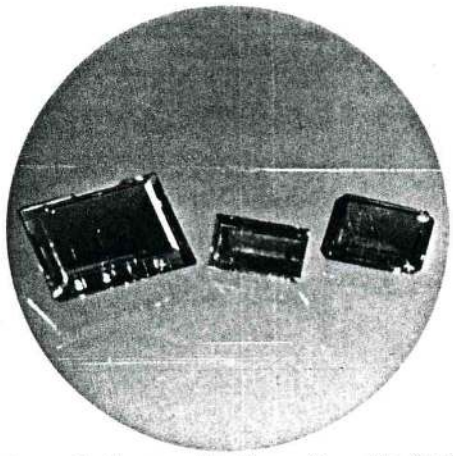
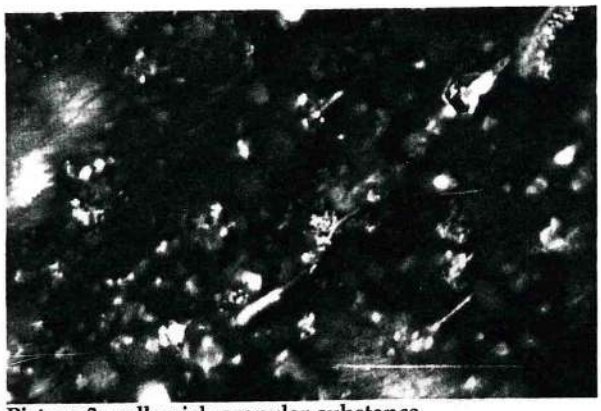
What to look for in Vasar synt



Picture 1: synthetic emerald, Vasar, from the Soviet Union

Picture 2: hematite platelets at a magnification of 40x



Picture 3: yellowish granular substance

Although a synthetic emerald called Vasar is difficult to identify because it is similar to natural emeralds from Colombia, it can be detected by using the right equipment and knowing what to look for, a mineralogist from the Swiss Foundation for the Research of Gemstones, Dr Henry Hanni, said.

Growth irregularities of Vasar can be detected using an optical microscope, but for accurate identification,equipment such as a scanning electron microscope, an electron microprobe or a Raman-Laserprobe is necessary, Dr Hanni said.

Vasar is grown by the hydrothermal process in the Soviet Union.

What can be seen

The physical properties of Vasar are not different to those of many natural emeralds. Vasar is highly transparent and colour ranges from yellowish to bluish green, see picture 1. The inclusions found could easily be mistaken for dark mica or hematite flakes similar to inclusions in emeralds from Colombia.

Viewed under an optical microscope at a magnification of 40x, black inclusions resembling hexagonal hematite platelets, or mica flakes, can be seen, picture 2.

Also visible in the stone, see picture 3, is a yellowish granular substance and nail-like hollow tubes.

Another visible internal feature is growth irregularities or graining, picture 4 and 5, due to uneven growth. This is found in most synthetic emeralds produced by the hydrothermal process, such as Biron, which is grown in Australia.

A growth shadow, picture 6, is also visible and is caused by a black platelet that has crystalized into a nail-shaped tube in which the growth solution is trapped. Part of the solution has decomposed into gas and part is liquid.

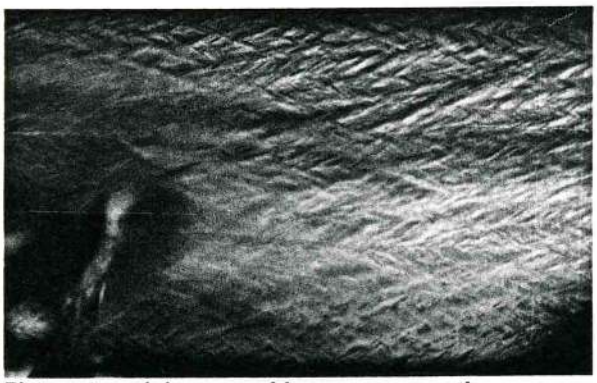
What can be measured

The synthetic nature of the emerald can be proved with comparative microprobe analysis which shows a high content of iron and small amounts of copper and nickel. There is no sodium and magnesium.

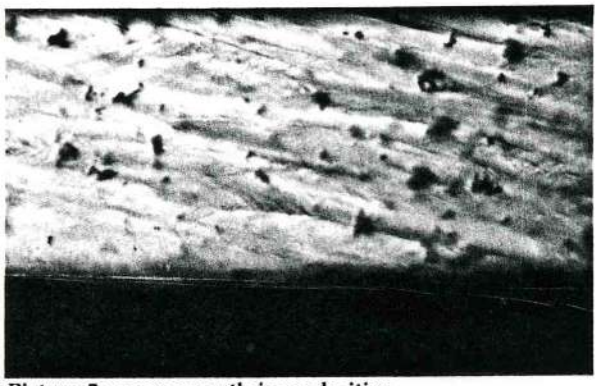
An energy spectrum of the inclusions obtained from a scanning electron microscope shows that the black platelets consist of iron, chromium, nickel, copper, manganese and titanium. These elements are from the steel autoclave, the container in which Vasar was grown in the laboratory.

An energy dispersive X-ray fluorescence spectrum proves the presence of chromium, iron, nickel and copper. Nickel and copper are not found in natural emeralds.

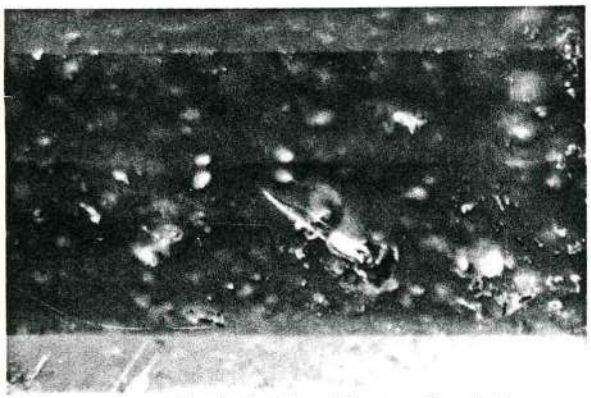
hetic emerald



Picture 4: graining caused by uneven growth



Picture 5: more growth irregularities



Picture 6: crystalized platelet with growth solution trapped inside casts a shadow