Examples

Several of "colored symmetry" can occur in these structures. If each vertex is given a "color" then the phenomena

If each unit cell of the periodic cell structure con­


If G contains additional 2-fold axes, one may distin­
guish different cases with respect to the connectivity
of the graph formed by these axes. If such a graph is
connected, in most cases it is possible to derive one
(or two) related minimal balance surface(s) by simply
spanning a suitable skew circuit of the graph and using
the 2-fold rotations for continuation. If such a minimal
balance surface exists, the graph is called a generating
linear net and the circuit a generating circuit of the
surface. In this way 17 types of minimal balance sur­
faces have been derived. The corresponding inherent
symmetries are: Im3m-Pn3m(2 types), Pm3m-Fd3m(2),
Ia3d-I43d(1),Ia3d-Ia3(1),I432-P432(2),P622-P312(1),
P622-P622(1), P42/mnm-14/mmd(2), P4/mcm-P42/mmm(1),
P4-22-P42,22(1), Pnnn-Fddd(1),Cmca-Imma(1),Pcmn-Cccm(1).

Twofold axes forming only 2-dimensional parallel nets
give rise to minimal balance surfaces like the H surface
and the R surfaces (Schoen, NASA Technical Note No. D-5541, 1970). Corresponding new such types have also
been derived.

In addition minimal balance surfaces exist which are
spanned by non-intersecting twofold axes and/or (roto­)

Inversion points (e.g. Ia3-Pa3 and the gyroid surface
with Ia3d-I43d,32).