treatment in the concentrated-sulfuric-acid-based mixed acid, it has a significant drawback that sulfur compounds remain therein in large amounts and the content of S is particularly large. For this reason, there is a drawback that, when this expanded graphite sheet is used under such conditions as a heated condition, reduced pressure, or gas substitution, the atmosphere is contaminated because of these impurities. This drawback tends to be particularly evident especially when the content of S as an impurity is high.

In view of the foregoing, the present inventors have proposed a flexible, high-purity expanded graphite sheet in which the content of S is 15 ppm or less and the total impurity content other than S is 20 ppm or less.

CITATION LIST

[PATENT DOCUMENTS]

[0004]

[Patent Document 1]

Japanese Published Unexamined Patent Application No. H04-021509 A

SUMMARY OF THE INVENTION

[0004a]

In one aspect, there is provided an expanded graphite sheet characterized in that all impurities are at a level less than respective detection limits, wherein: the impurities include Al, B, Be, Ca, Cu, Fe, K, Li, Mg, Na, Ni, S, Si, Ti, V, and Zn; the amounts of the Al, the B, the Be, the Ca, the Cu, the Fe, the Li, the Mg, the Ni, the S, the Ti, the V, and the Zn are determined by an ICP emission spectroscopy method; the amounts of the K and the Na are determined by an atomic absorption spectrometry method; and the amount of the Si is determined by an absorption spectrophotometry method, wherein: the amount of the Al is less than 0.08 mass ppm; the amount of the B

is less than 0.1 mass ppm; the amount of the Be is less than 0.02 mass ppm; the amount of the Ca is less than 0.04 mass ppm; the amount of the Cu is less than 0.08 mass ppm; the amount of the Fe is less than 0.04 mass ppm; the amount of the K is less than 0.1 mass ppm; the amount of the Li is less than 0.01 mass ppm; the amount of the Mg is less than 0.02 mass ppm; the amount of the Na is less than 0.05 mass ppm; the amount of the Ni is less than 0.1 mass ppm; the amount of the S is less than 1.0 mass ppm; the amount of the Si is less than 0.1 mass ppm; the amount of the Ti is less than 0.09 mass ppm; the amount of the V is less than 0.07 mass ppm; and the amount of the Zn is less than 0.1 mass ppm., wherein the type and amount of impurities are ones at the manufacturing stage, wherein a packing material with which the expanded graphite sheet is packed contains B, Ba, Ca, Cu, Li, Ni, Mn, Mo, Ti, and Pb, and when determined by an ICP-MS method, all the elements are at a level less than respective detection limits, wherein, the packing material contains Al, Fe, Cr, Mg, Na, V, and Zn; and when determined by an ICP-MS method, the amount of Al is equal to or less than 2×10^{-7} mol/m^2; the amount of Fe is equal to or less than 3×10^{-7} mol/m^2; the amount of Cr is equal to or less than 2×10^{-7} mol/m^2; the amount of Mg is equal to or less than 2×10^{-7} mol/m^2; the amount of Na is equal to or less than 5×10^{-7} mol/m^2; the amount of V is equal to or less than 2×10^{-7} mol/m^2; and the amount of Zn is equal to or less than 2×10^{-7} mol/m^2, wherein the type and amount of impurities meet the following requirements at a use stage in a condition in which the expanded graphite sheet has been packed with the packing material and thereafter removed from the packing material:

the impurities include Al, B, Be, Ca, Cu, Fe, K, Li, Mg, Na, Ni, S, Si, Ti, V, and Zn; the amounts of the Al, the B, the Be, the Ca, the Cu, the Fe, the Li, the Mg, the Ni, the S, the Ti, the V, and the Zn are determined by an ICP emission spectroscopy

method; the amounts of the K and the Na are determined by an atomic absorption spectrometry method; the amount of the Si is determined by an absorption spectrophotometry method;

the amount of the Al is less than 0.08 mass ppm; the amount of the B is less than 0.1 mass ppm; the amount of the Be is less than 0.02 mass ppm; the amount of the Ca is less than 0.04 mass ppm; the amount of the Cu is less than 0.08 mass ppm; the amount of the Fe is less than 0.04 mass ppm; the amount of the K is less than 0.1 mass ppm; the amount of the Li is less than 0.01 mass ppm; the amount of the Mg is less than 0.02 mass ppm; the amount of the Na is less than 0.05 mass ppm; the amount of the Ni is less than 0.1 mass ppm; the amount of the S is less than 1.0 mass ppm; the amount of the Si is less than 0.1 mass ppm; the amount of the Ti is less than 0.09 mass ppm; the amount of the V is less than 0.07 mass ppm; and the amount of the Zn is less than 0.1 mass ppm.

PROBLEMS TO BE SOLVED BY THE INVENTION

[0005]

The above-described conventional method can provide an expanded graphite sheet having an extremely low impurity content. Nevertheless, when the expanded graphite sheet is actually used (for example, used as one member in a manufacturing apparatus that requires purity, such as in a silicon single crystal manufacturing apparatus), there may be cases in which the expanded graphite sheet contains impurities. The reason is believed to be as follows. After having been manufactured, the expanded graphite sheet is packed and shipped, and thereafter removed from the packing material and then used. In the packing and shipping stage, it is believed that impurities are