Two process graphs G and H over *Act* and P are *isomorphic*—notation $\mathrm{G} \cong \mathrm{H}$—iff there is a bijective mapping between their sets of states that preserves I, $\rightarrow$ and $\models$. Thus, if $\mathrm{G} = (S_{\mathrm{G}}, I_{\mathrm{G}}, \rightarrow_{\mathrm{G}}, \models_{\mathrm{G}})$ and $\mathrm{H} = (S_{\mathrm{H}}, I_{\mathrm{H}}, \rightarrow_{\mathrm{H}}, \models_{\mathrm{H}})$, then $\mathrm{G} \cong \mathrm{H}$ iff there is a mapping $i : S_{\mathrm{G}} \rightarrow S_{\mathrm{H}}$ such that $i(I_{\mathrm{G}}) = I_{\mathrm{H}}$, $i(s) \xrightarrow{a}_{\mathrm{H}} i(t)$ iff $s \xrightarrow{a}_{\mathrm{G}} t$ (for $s, t \in S_{\mathrm{G}}$, and $a \in Act$), $i(s) \models_{\mathrm{H}} p$ iff $s \models_{\mathrm{G}} p$ (for $s \in S_{\mathrm{G}}$ and $p \in P$), and for all $s' \in I_{\mathrm{H}}$ there is exactly one $s \in I_{\mathrm{G}}$ with $i(s) = s'$.

Usually one does not distinguish isomorphic process graphs. This means that one abstracts from the identity of the nodes. In drawings of process graphs states are represented as dots, a transition (p, a, q) is represented by an a-labelled arrow from p to q and the initial state is represented by an incoming arrow (not originating from another state). Hence these drawings represent process graphs only up to isomorphism.