The neighborhood $N(x)$ of a vertex $x$ in a graph $G$ is the set of all nodes adjacent to $x$. If $V(G) - N(x)$ is finite, then $x$ is said to be cofinite. The graph $G$ is called locally finite if $N(x)$ is finite for all $x$ and locally cofinite if each vertex is cofinite.

There exists the same term of neighborhood in general topology. For a topological space $(A;T)$, a neighborhood $U$ of $x$ is a set containing an open set $Q$ of $T$ such that $x \in Q \subseteq U$. If $U$ itself is in $T$, it is called an open neighborhood. In order to avoid confusion with the neighborhood of a vertex in a graph, we shall use topo-neighborhood in this paper for the topological sense.

**Lemma 1.** Let $(g(G);*,T)$ be a topological graph algebra. If $x \in V(G)$ and $N(x)$ is finite, then $\{y\}$ is open for all $y \in N(x)$.

**Proof.** If $y \in N(x)$, then $x * y = x$. As $(g(G);T)$ is Hausdorff, there exists an open topo-neighborhood $W$ of $x$ such that $0$ is not in $W$. Since $*$ is continuous under the topology $T$, there exist open topo-neighborhoods $U$, $Q$ of $x$ and $y$ respectively with $U * Q \subseteq W$. Then we have $Q \subseteq N(x)$ and $Q \setminus \{y\}$ is a finite set, and hence by the Hausdorff assumption it is a closed set. Thus $\{y\} = Q \setminus (Q \setminus \{y\})$ is open. \[ \]

**Theorem 1.** Let $G$ be an arbitrary locally finite graph. Then the graph algebra $(g(G);*)$ is not DT.

**Proof.** It is well-known that assuming the axiom of choice, every set can be well-ordered. Let $\leq$ be a well-ordering of $V(G)$ and let $T'$ be the topology on $g(G)$ consisting of the power set of $V(G)$ together with the sets of the form $\{0 \cup \{x_i\}\}$ where $\{x_i\} = \{x_k \in G : x_i \not\leq x_k\}$. Clearly, the space $(g(G);T')$ is Hausdorff.

To see that the topology $T'$ is compatible with