

## IONIC CONDUCTION

Ionic conduction consists of the movement of **IONS**, (ATOMS of either positive or negative charge), hopping from one site to another, in the lattice(s), of any material, via point defects, called “**vacancies**”.

**NOTE:** “**Vacancies**”, heretofore, similarly discussed in electronics, were addressed as “**Holes**”, [absent of any electrical charge], in any material, (empty spots between positive and negatively-charged particles).

At normal ambient operating temperatures, very little **ion**-hopping takes place, since the atoms are at relatively low energy states. **Ion**-hopping, refers to **Ions** moving in coordinated fashion, toward the next vacancy. As temperatures, go higher, **Ions** seeking vacancies, become more mobile, generating even more heat, etc.

Radio-frequency, (**R. F.**) waves, causes rapid changes of electrically-charged particles. They particles are attempting to re-align themselves, into North to South alignments, from the directional frequency changes, caused by the constant frequency shift, of **R. F.** waves

Assume microwaves at (**20 KHz**), 20,000 times a second. The left/right, right/left, transmitted waves, create “**friction**”, because the particles rub against one another! These rapid re-alignment, (friction-causing), movements, reacting to the **R. F.** Wave bombardment, causes the material to be heated.

The hotter the material gets, the more rapidly the **Ions** move, causing a run-a-way increase of temperature. As the **R. F.** continues its assault, on the material being bombarded, that material goes into its melting point. If the **R. F.** is **NOT** terminated, the material may go even further yet, ... into a cloud of vapor .... or ... even gas!

**NOTE:** Even “**micro-wavable**” containers **ARE** subject to this effect, over the long-term, (after several hours of exposure). But for ordinary home-cooking use, minutes, an hour, the containers appear, **NOT**, to be unduly affected.

The foregoing, is an explanation, why certain materials (**insulators**), may actually be impacted by **R. F.** waves, when normally, over the short term, the insulating materials appear, **NOT**, to be affected.

That lends credence, to the fact, that **ALL** materials conduct electricity, but some are less able to do so. Therefore, there is **NO** 100 % true, electrical insulator!

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