

# Comments on McFarland, “Causal Powers and Isomeric Chemical Kinds

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In his interesting and stimulating paper, McFarland argues that philosophers who construe chemical kinds as mereologically complex properties should accept structural and so-called ‘causal-cum-dispositional’ proper parts of such properties, in addition to what he calls ‘constituent properties’. I have a proposal concerning the argument, a question of clarification regarding the first and a general worry about the second proposal.

**No need for SSP.** McFarland develops his argument for structural parts of chemical kinds in analogy to Koslicki’s argument for formal parts of statues. While she relies on Weak Supplementation (and the claim that the lump is *not* a hylomorphic whole if the statue is), McFarland relies on Strong Supplementation. I do not see, however, why this is needed (nor indeed, that there is a strong analogy). Is not the the following argument equally, if not more, persuasive?

- 8 There is *butane* and *isobutane*. (assumption)
- 9 They are not identical. (assumption)
- 12 They do not have the same parts. (by Unique Composition)
- 11 They have the same constituent properties. (by the KCP)
- 13 They have parts that are not constituent properties. (from 12 and 11)

**Structural parts.** McFarland claims that the following two formulae distinguish the enantiomers, in that the first (second) expresses a relation that is part of the left (right) molecule in figure 5, but not of the other one:

- 21  $Cx_1 \wedge Brx_2 \wedge Clx_3 \wedge Fx_4 \wedge Hx_5$
- 22  $Cx_1 \wedge Hx_2 \wedge Fx_3 \wedge Clx_4 \wedge Brx_5$

But I do not see how they do this, unless further assumptions are made. The formulae differ only in the numbering of their variables. Therefore, they will differentially apply to some sequence  $\langle a_1, a_2, a_3, a_4, a_5 \rangle$  of five particulars only if we keep the convention fixed by which we assign members of this sequence to different variables. Perhaps the CIP Priority rules are required to make sure of this (though it is also standard logical practice), but I still do not see why the only notionally different (21) and (22) should make for, or at least express, the ontological difference between the enantiomorphs. Instead, it seems to me, we need a 4-adic relational predicate, expressing orientation, such that

- 21’  $Cx_1 \wedge Brx_2 \wedge Clx_3 \wedge Fx_4 \wedge Hx_5 \wedge R(x_3, x_5, x_4, x_2)$
- 22’  $Cx_1 \wedge Brx_2 \wedge Clx_3 \wedge Fx_4 \wedge Hx_5 \wedge R(x_3, x_2, x_4, x_5)$

where “ $R(x_1, x_2, x_3, x_4)$ ” is true of four individuals if they are arranged counterclockwise in a circle. But then of course it expresses the kind of property McFarland urges us to adopt in his second proposal. So probably there is something I missed (also, incidentally, do I not quite see why, if we accept the second proposal, we have to adopt the first as well).

**Reflectance properties.** McFarland’s second, complementary, suggestion is to take the kind *butane* (*isobutane*) to contain, as a part, the dispositional property *rotating polarized light in a clockwise (counterclockwise) direction*. My worry is a rather basic one: why privilege this particular dispositional property, and not any other causal or scientifically acceptable in which they differ, or even the response-dependent one *looking like the molecule pictured on the left in figure 5*? In what sense is this dispositional property more basic, fundamental, privileged so as to *explain* all the other differences between enantiomers and to deserve its place among their parts? And is this a general principle: that the fundamental chemical properties of chemical kinds are parts of them (though this is perhaps rather a question for KCPs).