

# Tiger bones, insects and herbs

## FTIR spectrometry in traditional Chinese medicine

The roots of traditional Chinese medicine (TCM) date back to more than two thousand years. With its origin in Eastern Asia and separate roots in Korea and Japan, TCM is today widely practised in Europe – and also within the German health care system. From a health policy point of view, however, TCM is still accepted only to a limited extent.

TCM is represented by numerous medical societies, such as the Deutsche Ärztesellschaft für Akupunktur (DÄGfA), one of the largest natural medicine professional societies in Germany. In addition, there are a number of scientific organizations for quality assurance and implementation of medical studies in the area of TCM. This includes the non-profit TCM-initiative ([www.tcm-initiative.de](http://www.tcm-initiative.de)) offering the highest possible transparency with respect to TCM herbal quality available in Germany. This association also organizes collaboration among research institutes, clinics and conventional physicians as well as TCM specialists, and ensures the future implementation of TCM studies. The TCM-initiative also provides information on possible health insurance reimbursements of various forms of TCM therapy.

TCM usually combines various methods. The five most important ones are acupuncture, massage, dietary therapy, exercise and alternative medical therapy.

### Alternative medical therapy, the most significant method of treatment

Alternative therapy is based on the administration of formulations derived from natural products and offers the most significant therapeutic range of all five

methods. The chemical composition of TCMs is of special importance with respect to the Arzneimittelgesetz (German Drug Registration and Administration Act)

The professional literature, for instance the journal "Clinical Chinese Pharmacology" [1], names 515 individual formulations. Approximately five of these are derived from vertebrate preparations or parts such as tiger

are routinely used in quality control for the unequivocal identification of compounds. This relates to raw materials as well as to finished products and packaging materials.

Individual compounds exhibit a characteristic infrared spectrum so FTIR technologies therefore offer fast and straightforward, unequivocal analytical results of the most diverse samples.

all raw materials, mixtures and pharmaceutical products such as TCMs are controlled using infrared spectrometry.

The IRAffinity-1 enables fast and reliable routine analysis and ensures a uniform quality of the active drug compounds in order to protect consumers.



IRAffinity-1 with microscope AIM-8800

bones, as well as from fossil bones of pre-glacial animals. Five other formulations are of mineral origin or consist of excrements, secretions, worms, insects and mollusc parts and 85 originate from plants.

In Europe, alternative medical therapy is usually limited to phytotherapy, i.e. the use of active compounds originating from plants under controlled cultivation. In Europe, the only animal ingredients officially used in alternative medicine are seashells (for instance the Chinese oyster or the arca shell).

### FTIR spectrometers for quality control of raw materials, finished products and packaging

FTIR spectrometers such as Shimadzu's IRAffinity-1 (Figure 1)

FTIR analysis is carried out using the IRAffinity-1 in combination with a single reflection ATR (attenuated total reflection) unit with a diamond or KRS-5 crystal. This measurement setup provides unequivocal infrared spectra of typical packaging materials such as polypropylene and polyurethane.

In this way, it is also possible to analyze natural compounds such as ginseng, whose composition can vary widely depending on the harvest and soil conditions. FTIR also provides unequivocal spectra for these complex samples and enables reliable quality control in traditional Chinese medicine.

Currently, more than 1100 infrared spectra are registered in the Chinese Pharmacopoeia, significantly more than in the British or Japanese Pharmacopoeias, as

[1] Manfred Porkert:  
Klinische Chinesische Pharmakologie.  
Fischer, Heidelberg 1978

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