

## Supporting information

### Determination of Molecular Weight Distributions

The MALDI-TOF mass spectra were obtained on a AUTOFLEX Bruker apparatus using dithranol (1,8,9-anthracenetriol) as the matrix for poly-2-phenyl-2-oxazoline and DHB (2,5-dihydroxybenzoic acid ) for 2-methyl and 2-ethyl-2-oxazoline oligomers. The samples were prepared by mixing methanol solutions of the polymer ( $10^{-4}$ M) and matrix in a typical ratio 1:1 (v/v). All the polymer analysis were carried out at the Associated Laboratory of REQUIMTE.

The masses of the polymer peaks from mass calibrated spectra, combined with their relative intensities (height or area), allow precise calculation of the number average molecular weight ( $M_n$ ), the weight average molecular weight ( $M_w$ ), and the polydispersity ( $M_w/M_n$ ), which serves as an indication of the width of the mass range of the polymer distribution.  $M_n$  and  $M_w$  are defined as

$$M_n = \frac{\sum N_i M_i}{\sum N_i}$$

$$M_w = \frac{\sum N_i M_i^2}{\sum N_i M_i}$$

where  $N_i$  is the molar fraction of the molecular ion with a degree of polymerization  $i$  and  $M_i$  is the mass or, without resolution of the isotopic distribution, the average mass of the  $i^{\text{th}}$  polymer.